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I

HERBART AND PESTALOZZI COMPARED

The progress of education is in a zigzag line, from extreme to extreme. This appears throughout all history. But were it not that succeeding times profit by the experience of their forerunners, the progress would not be assured. The history of the good and bad incident to one extreme is sufficient to prevent its repetition. The extremes are new ones at least in substantial features, and not a discouraging survival of past issues.

At one time the schools have tended almost exclusively to memory culture, with very little attempt at verification by original research and observation. This was the case with what is called the old education, and if we are to believe the critics this ought to be called the prevailing system of our time also.

But Pestalozzi exploded the theory on which it rests and substituted another. He laid stress on sense-perception, verification, and original research. The practice of our time may not correspond to its theory, but certainly all writers uphold the Pestalozzian doctrine of instruction by object lessons.

But while this reform is progressing toward its extreme, another tendency has begun within a few years, and it promises to force a new departure on our zigzag line. This is the doctrine of Herbart, which holds that it is not so much sense-perception that is wanted in education as apperception—not so much seeing and hearing and handling things, as recognizing them and understanding them.

This doctrine of apperception stands opposite to that of perception, but it is not a return to the standpoint of memory. On the contrary, it is rather a more inclusive doctrine, that combines perception and memory in a higher faculty.

Figuratively speaking, we may truly say that it is what we inwardly digest or assimilate of what we memorize or perceive that nourishes our minds, just as it is literally true that it is not what we eat, but what we digest that nourishes the body. The process of mental digestion and assimilation is called apperception by the recent reformers. It is well enough to have a new technical term when we form an idea that contains many old ideas united in a new concept. This process of mental digestion is partly expressed by each of several words, such as identify, recognize, explain, interpret, comprehend, understand. In fact, to classify the new under some already known species, to subsume a particular under a general, are parts, but not the whole of apperception. It is the adjustment of the new idea to the stock of ideas which already form our intellectual wealth. It is what we sometimes call thinking instead of mere seeing or mere memory. We say: "Teach your pupils to think, and that is better than to acquire information by perception or memory." Here we mean that it is better to apperceive than to perceive or remember.

The interaction between the new idea and our stock of old ideas is the essential thing for education. This interaction, we see, is called apperception, and it is a twofold process. For the new modifies the old and the old the new. The new object adds something however slight to my stored up knowledge of the class to which it belongs. On the other hand, what I bring to it with the wealth of my experience throws light on it or explains it. I see its differences from others of its class, and know it to be only a partial realization of the possibilities that belong to the species. It is perhaps only a partial development in some of its features and an overdevelopment in others. I look for the explanation of these

defects and superfluities and learn to know the causes. Thus takes place mental digestion.

Professor Ludwig Noiré [1] has illustrated this operation of apperception wherein we add to a new idea a train or series of remembered ideas, and project beyond it another series of ideas or ideals formed by the imagination. He has taken the object perceived, a piece of bread, and connected with it a train of presuppositions which our apperception at once supplies to it from experience already stored up, thus: grain, rye, flour, dough—Bread. Or, connecting the processes: planting, harvesting, threshing, grinding, kneading, baking—Bread.

What an immense series of ideas a piece of bread calls up to us! By our activity of apperception we think of the materials out of which the bread is made, and of the processes by which they have been produced. Not only the grain, but the lard and the yeast, and perhaps milk and sugar and warm water—each of these has its collateral series of ideas running out sidewise in long series. Then each of the processes, planting, threshing, grinding, etc., has its own series, or rather its manifold of different series of ideas. Bread suggests or calls up the combined result of our perceptions and conceptions that relate to this product. Our experience as preserved is the net result of apperception.

But this is only one-half of the mental apperception of the object, a piece of bread. Professor Noiré makes a diagram with the presuppositions just named placed before the word bread, and follows it with the objects and uses which our apperception associates with the piece of bread to explain its existence. These are, first, the ideas of food, organic tissue, life, etc., and the processes of eating, digesting, nourishing the strength, supplying the heat, etc. Again, each of these ideas, as before, has its several collateral series of ideas.

This example indicates to us the scope and bearing of the new pedagogy as related to the course of study. It will give its attention to the relations of things, and especially to the causal relations—endeavoring to think the object in the total-

[1] In the *Open Court* (Chicago), No. 137.

ity of its existence. When we see a thing in all its relations we comprehend it. We may apprehend it in one, or a few, of its relations. It brings the new object perceived into connection with all that has been formerly experienced; it is naturally led to undertake new investigations, to verify conjectures and probabilities which previous experience suggests as likely to exist.

Recalling our Aristotle we notice that apperception deals with his famous four kinds of causes. First, the material cause of the bread, namely, there is the flour and yeast and lard and water; also the same in other forms, as grain, hops, fatted swine, etc. Second, there is the efficient cause, the power of energy that operates changes on the material, namely, the planting, harvesting, threshing, grinding, kneading, baking, etc. Third, there is the formal cause or the ideal form which the cause produces at the several stages of operation, namely, flour, dough, bread, etc. Then, lastly, there is the purpose or object, the end and aim, called also "design" and "final cause," and this is described by the words food, nourishment, etc. For the final cause is the motive of the will that moves the whole series.

The essential difference between the final cause and the efficient cause must not be lost out of sight. The efficient cause is a constraining force, an external necessity brought to bear upon some being. But the final cause is a purpose or ideal which has no constraining force, though we call it a motive. Its existence is solely through the mind that thinks it, and it gets realized by an act of free volition. The purpose for which a thing is intended is not yet an existing thing, but only an ideal formed by the mind. To say that a motive constrains the mind is to say that something acts before it exists as a reality.

Apperception includes these two trains of ideas—one directed to the past becoming of the object apperceived, to its material, its formal, and its efficient causes; and the other to its future, to its purpose, and reason for existence.

Right here we catch a glimpse of the significance of the

labors of the Herbartian educators of Germany who are busied over what they call "concentric instruction." We see that they are at work on a course of study which is calculated to prepare the process of apperception—get ready the "apperception-stuff." This idea has, of course, been understood and acted on by all who have arranged the course of study so that the lower steps of progress lead to the higher steps, and help to explain them. Concentric instruction selects some theme that can arouse the interest of the pupil, and then builds forward and backward, and on both sides outward the series of ideas that form the totality of relations necessary for comprehensive thinking. If this is done in one instance, say in the study of *Robinson Crusoe*, then the pupil will have formed to some degree the concentric habit of mind, the habit of searching out the manifold relations of an object and of connecting it with all that is known, or, technically expressed, the habit of apperceiving it.

Looking back to Pestalozzi we see that his keyword, sense-perception (*Anschauung*), as the point of departure of all intellectual instruction did not furnish any more than the beginning. One must do more than begin: begin with sense-perception and proceed to a thinking consideration of the object. Do this not only with that narrow sphere of experience that includes what is audible and visible and tangible to any single individual, but also with that infinitely wide realm of experience that the race has accumulated and transmitted to us by means of the printed page. Do not stop with memorizing it, but apperceive it and interpret it all into terms of our own experience; translate the unknown into terms of the known.

Pestalozzi worked much to solve his problem of how to get beyond his beginning with sense-perception. He could say only that the elements of human knowledge are form, number, and language. In this he gives no hint of causality as the essential element in knowledge. Number, form, and language do not furnish any of the series with which effective apperception may be performed. Only accidental resemblance,

only quantity and an inventory in words can be reached on Pestalozzi's road. The association of ideas by accidental relations is the characteristic of the simple-minded and empty-headed. The association by causality in its fourfold aspect is the characteristic of the wise man and thinker.

Thinking is not, as many of Pestalozzi's followers suppose, an elevated sort of sense-perception, but it is wholly a reaction against it. The mind sees an object before its senses. It at once discounts its value as a real by seeking to find its cause. It leaves the object as a dead result, and proceeds to trace out its past history, its metamorphoses, and the causes and forces which have produced its present shape. Neither does it content itself with replacing the real object before it by a series of past and gone realities that mark its history, but it seizes the force or energy that has revealed itself in the process and in the dead result before it, and therewith it turns to the future and sees the destiny of the real object.

By apperception we suspend the real objects before our senses between two chains of ideas—the series of past forms and the series of future forms—and thus we comprehend the sense-object.

Apperception is thus a process of emancipation from sense-perception. We reduce the object, here and now present, to its subordinate place in the world series, and thus free ourselves from its insolent assumptions. We prove it to be only one step in a great series, only one form, in a long series of metamorphoses—it takes all the series to reveal the essence or causal energy that produces this one dead result.

We learn that the senses perceive only phenomena or appearances of the essential cause, but we climb by thought or apperception to the vision of the cause or energy face to face.

Finally, it is apperception that gives us any acuteness of perceiving with the senses.

What endowed Asa Gray with the ability to observe plants, or Agassiz with his ability to recognize fishes? It was the acquired power of apperception—the power to re-enforce the

present perception by the total experience of a long life spent in studying the causal series of plants and fishes. They could also re-enforce their own vision by the aggregate vision of all the naturalists since Aristotle. Hence it came to be said that Agassiz could recognize and describe the whole fish by one of its scales; that Cuvier could draw the entire skeleton from a single bone; that Gray could write the history of a tree from a single glance at it, caught from a car window.

The Herbartian trend on our zigzag of progress, therefore, helps us to re-enforce sense-perception by the memory, through the use of the causal series of ideas. It therefore combines the two former trends in a higher.

Doubtless there will be new trends on the zigzag of progress to correct the extremes and errors of Herbartianism, but, compared with Pestalozzi's theory of intellectual instruction, or with that other and older theory of memory as the sole intellectual faculty, there can be no doubt that the Herbartians are right.

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II

THE REAL GROUND FOR STATE CONTROL OF SCHOOLS

I write the title of this article as above with deliberate intention, though aware that the chief word in it will probably, to many or most of my readers, seem out of place in the company of its attendants. I wish to emphasize the need and the right of state *control;* the usual American habit of thought on public schools, on the contrary, is preoccupied with an interest in state *support.* Public support of schools, and that, moreover, entire, has become so fixed a habit in our popular consciousness that it may almost be said to make up the whole usual conception of the state's relation to education. To this usual consciousness the only natural thesis would seem to run: "The real ground for state *support* of schools." And even this would savor somewhat of unwelcome novelty; for is not state support of schools a matter of course?—and why should anybody be raising a question as to its ground? or, much more, imply that there is an important distinction to be made between the real ground and apparent or illusory grounds? Is there, or can there be, any ground except the fact that the state *owes* a good education to every child within its domain? And when talk of state *control* begins, what possible reason or right can there be for the state to control education, except such as comes from the state's supporting it, and such as is absolutely dependent on that fact?

I do not mean, to be sure, that the question of state control of schools can be justly discussed apart from that of their state support. The latter question will inevitably blend with the former. We shall find it impossible to complete our exhibit of the real ground for state control, without also determining the real ground for state support. State support as an inci-

dental result of control does not follow with any universal reach or unvarying uniformity; nor does it with any necessary certainty follow at all.

As already noticed, this view, however true and sound it may prove to be, is remote from that which is tacitly assumed, and often openly proclaimed, in our American practice and popular theory. The doctrine commonly current appears to be that the state, quite as strictly as the single private citizen or the artificial corporation, has its right of control limited within its right of ownership, while this is bound by the actual expenditure of personal labor or capital, or both. In short, the control of the state over education is limited to what it supplies and owns. Private schools are utterly beyond it; legislation pertains only to public schools; and public schools are, essentially and primarily, schools wholly supported and entirely owned by the state. At the very least, then, this doctrine rests on the assumption that the land and the capital requisite for the complete administration of schools must be supplied by the state, and thus be disappropriated. And so, whether deliberately or not, this popular philosophy of public education presupposes one great stride, at least, in the application of the central tenet of socialism, the publicizing of all land and all capital.

But this prevalent theory of public education is not content with presupposing the moderate doctrine of socialism; in its free and enthusiastic flights, it cannot stop short of downright communism. Throughout the wide extent of our commonwealths, the crusade for universal free schools, for public union, or graded, schools, has almost invariably been heralded and won with the cry: *The property of the state should educate the children of the state!* As if the state were a vast commune, to which alone all the children and all the property alike belonged *en bloc;* and as if all the property within the domain of the state were to be amalgamated into a common fund for the direct general benefit, to be drawn upon *ad libitum* for each family and each child, in behoof of awarding to each the opportunity of winning the largest possible rewards

of life, whether each earned it or not. And because the state thus owns and gives away this enormous capital, and because of this alone, the citizen beneficiary accords to it the common privilege of the capitalist and owner—the privilege of controlling and directing the outlay. In that control and direction, however, let the state, like every other capitalist, beware how it exacts anything from the recipients of its bounty! Let its energies be occupied solely with the effective distribution of the greatest mass of opportunity to the utmost possible number! Let demands for compliance with any high standard of performance by the beneficiaries be known, and branded for what they really are —for infractions upon the rights of the free citizen, the self-directing source of law, whose humble creature and obsequious agent the state forever is, and should forever recognize itself as being!

Such assumed bases for state action, when thus carried to their consistent final form, are exposed in their naked flimsiness, and are seen to be unworthy of the sober and diligent, upon the savings of whose industry, physical or mental, the ceaseless burden of taxation falls; a burden cheerfully borne, if objects promotive of rational self-respect, or consistent with it, are gained or likely to be gained thereby, but unjustifiable and intolerable on any lower ground. Some loftier, broader, and profounder view of the nature of the state, and of our relations to it as private persons, as members of the family, and as participants in the civil or economic order, must be brought to light, before we can rationally accept the doctrine that education is one of its functions, and that it may levy taxes for the support of schools. It is of the essence of the state to incorporate justice; and the vice of every communistic or socialistic theory of its nature is, that under the guise of a professed enlargement of justice, the real heart of justice is violated. Recommending themselves with the cry, borrowed from the humane consciousness rising in Christianity, that "we ought to bear one another's burdens," these theories of the state in reality erase from its operation all genuine and

sound reciprocity. They violate one of the profoundest instincts of justice, because they really tend to lay upon the diligent and capable not only their own burdens, but those of the incapable and shiftless besides. That the diligent and capable have, in and through the state, a duty to the incapable and shiftless which it is guilt to neglect, is true enough; but it consists mainly in aiding and, if need be, compelling them to bear their due portion of the common burdens. The state is a union of persons vivified by *manhood*, and dignified with the self-respect that rests upon a self-activity conscious of self-support. Its living germ is sterilized when it is changed from this organization of manly and womanly freedom, into an association for the distribution of alms.

If the state, then, does not *owe* education to the children in it, and if its right to control education is, therefore, not the mere commercial right derived from its furnishing the capital required to pay the debt, the question may pertinently be asked: Has the state any such right of control at all?—and if it has, why?—whence does the right arise?

To this question, the summary answer may be given: The right comes directly from what the state *is*, viewed in connection with what education is; the control is founded on a nature essential to both, and common to the two. But to exhibit the real meaning and the warrant for this, let us now examine, what that essential nature is, common to education and the state which carries with it the control in question.

For our present purpose, the most comprehensive view of the nature of education will be obtained by considering its end or aim. And here let us not be misled into taking that plausible short-cut to our desired conclusion, which seems to be afforded by the statement so often and so readily made, that the object of education is to produce good citizens. Over and over, and in almost every quarter of our country, we hear it said that only with this as its object can the public support and administration of schools be defended. But though good citizenship is certainly embraced in the aim of education, the aim itself needs a larger and more sig-

nificant statement, and can have it. The real object of education and of citizenship alike, is to make, not merely good citizens, but good men. A true and sound human character is their business: true, as measured against the rational ideal; and sound, as tried in the environment and station where the person has to stand and maintain himself. A thorough discussion of the end of education would therefore repeat the world-old debate upon the true aim of all human action, and demands the settlement of the supreme ethical question: *What is the chief end of man?* The long historic way of philosophy has at length, however, brought us to a more satisfactory answer of that question than we once possessed. Delaying over the time-worn issue between Perfection and Happiness, Altruism and Egoism, Intuition and Experience, Virtue-in-itself and Utilitarianism, long enough to discern the inevitable checkmate that each of these sides can put upon the other, when either is taken for the whole truth, human thought on ethics has at length come upon the solvent view that the sufficing aim of man is to be found only in the realization of his own true nature. In this, Perfection and Happiness, Egoism and Altruism, and all the rest, find alike their recognition and their higher fulfillment. In short, it is in *character* that the solution is found—in that active devotion to reasonableness, from personal insight and intelligent conviction, which is at once true freedom (and therefore inexhaustible happiness) and genuine benevolence (and consequently unswerving duty). This character may therefore be best expressed as RATIONAL FREEDOM, and the realization of this Rational Freedom in every child consequently becomes the final goal of all sound education; each is to be developed into a self-directing rational intelligence. And the essential, the all-enveloping light of such an intelligence, is that it knows itself as a member of an indissoluble society of such intelligences, every one of whom is, with equal certainty, an end, and never merely a means, of the others. Rational Freedom is thus seen to be the real meaning and being of life in the moral order; it is the perception of the sacredness of

persons; its realization in each person is the absolute security of all the rest, as well as the security of himself. Hence it is at once the vindication of rights and the insurance of duties, and thus covers the entire scope of morality.

But where, in the actual world, is the just measure of this Rational Freedom to be found? How is it to be raised from the empty unreality of a vague ideal in the general imagination, or from the more fatal worthlessness of private whims and caprices, into the substantive power of public practice, approved by an historic consensus of ages? The great problem here is the genuine union of Freedom and Reason—how private judgment can safely be intrusted with the public welfare; how a public judgment can prevail, and yet private judgment be neither destroyed nor constrained; how the originating energy of judgment shall be personal and private, as from its nature it must be, and yet its effective result, its character and compass, be public and universal.

And precisely here it is that an adequate view of the nature of the state and of its consequent functions becomes all-important, and, if reached, furnishes the solution of this puzzle; while at the same time it explains the necessary right of the state to legislate for schools. Yet its right to such legislation rests on the same plain ground as its right to legislate upon the other actions of its subjects. As in regard to their actions in general, this is confessedly not derived from furnishing them support, but is original and intrinsic, so in regard to their actions in the matter of education, it is likewise independent of the question of support—is underived and intrinsic. The state, in so far as it is effectively existent, is simply the organized summary of the Rational Freedom that has been historically realized. It is so much ideal humanity, so much universal reasonableness, *instituted;* that is, set steadfastly into the world of sense, planted securely on the foundation of Nature itself, incorporate with the powers of Nature, which it has subdued and reorganized under its own moral order.

We thus come in clear and easy sight of the interior *rapport*

which exists between the nature of the state and the nature of education; which must therefore be maintained, and not only maintained, but nourished and developed. The essence of education, as displayed in its only comprehensive and wholly justifiable aim, is Rational Freedom in each of its subjects; the essence of the state is also Rational Freedom, to a certain extent realized and intrenched in that very sense-world whose natural antagonism to reasonable law gives occasion to that "rise" of the state which we are so prone to mistake for its origin—that is, for its justifyng cause. With that "rise," indeed, external circumstances give also the field for the indefinite career of the state, in which it is to advance to larger and larger victory, to solider and solider self-institution. But the indispensable and securest condition of maintaining that career is, that there shall be no decline in the total of realized Rational Freedom, either in its level or in its extent; in short, the state, which is the living causative repository of this realized reason, and the sole adult and competent judge of its present and its future, must itself insure, by legislation thoroughly executed, the character of the ever-coming new generation. The opportunity afforded by what Mr. John Fiske has so happily and emphatically brought to the world's attention under the title of the Rise and Lengthening of Infancy, must be improved and directed by the state. More exactly speaking, the state must see to it that the parental office to educate the child is so guided that the state itself, and therewith the child's mature humanity, shall not only suffer no harm, but be secured in a larger fulfillment of its nature.

The state *must*, because the state alone *can;* the state has the right, because the state is what it *is*—the only measure of public judgment, the only standard of reason actually attained and objectified.

Avoiding, then, the confusion by which the embodiments, the representatives, the agencies, or the mere paraphernalia of the state are mistaken for the state itself, and keeping firmly by the deep view that reveals the state in its true nature as

a form-principle of thinking rational life—itself the reality, indeed, of what we commonly call conscience or the recognition of a moral world—we may now revert to our previous conclusion, that the state has in itself the primary and sufficient ground for directing and controlling education. The public reason consolidated in institutions and laws must be brought to bear on the training of the youth who are afterward to constitute the nation and represent the state. In no other way can the state maintain itself, much less advance in its career of larger and larger self-realization. And this right of self-preservation involves no tyranny, because the real life of the nation, the real life of the civil order, the real life of the family, and the real life of the child are all identical.

The argument for state control of schools has thus far been rested on universal grounds, derived from the essence of the state, and valid for it in all times and places, so far as that essence may at any time and place be effectually present. But while the argument holds mainly in this general way, there are the strongest additional reasons for its conclusion, derivable from the state as it has come to be in our days. The rise of constitutional governments, with their carefully guarded Bills of Rights, has effectually provided against the dangers to which autocratic or despotic administrations may have exposed the common life of education and of the state; but by their introduction and continued extension of suffrage, and their steadfast advance toward universal suffrage, they have exposed both to a new and a greater danger. Unconditional suffrage is practically a settled fact for us in the United States; for us, therefore, the safety of the nation, and of all its commonwealths, depends absolutely on the universality, the vigor, and the soundness of education. In proportion as we can make every voter a conscientious judge of men and measures, we may hope to maintain a real nation through the continuance of the real state. In serious default of such a result, universal suffrage must become our ruin. The very life of the modern state depends on the wisdom and efficiency with which it succeeds in controlling and guiding the school.

From all this the conclusion seems plain, that not merely by weight of abstract argument, but also by the authority of intelligent modern governmental practice, the real basis of state control over schools is laid in the very being of the state, in the nature of its general functions, and in the exigencies of its self-maintenance. And the first, the direct inference from this truth is not the state *support* of education, but its state enforcement and direction; the right, nay, the necessity of legislation to induce and to compel education, and to insure wise administration of it. State support of schools, if it follow at all (and I heartily admit that it justly does and will), will follow simply as a condition of efficiency in carrying out administration. So far from its being an axiom of justice that the state should furnish every grade of education free of charge, the sound view is that no grade of it should be given away, except as the emergencies of the situation, the state's own executive necessity, or convenience, require it. The state, too, must of course have regard to the other rational institutions—the Individual, the Family, the Economic Order—which it enfolds and protects, and apart from whose vigorous life it cannot itself live; it must exercise a benignant care over the right of every person, every family, every occupation, and trade, to that precious condition of Rational Freedom, the chance and time to earn a self-support. And while in this care it may judge the course prudent and just, as well as convenient for its own executive needs, to support all grades of schools to such an extent as will secure their highest efficiency, there is another side of its problem—the pre-eminently moral side—which its own nature and the aim of its educational action alike forbid it to ignore: *it must beware of lessening the sense of personal, of family, or of corporate responsibility for self-support and self-production of character.* It must never establish in schools any method that will endanger this vital quality. Nor can it consistently take measures that would compel the parents to submit to one mingled contagion, children of every grade of morality and immorality, coarse-

ness and refinement, uncleanliness and cleanliness, high social development and low.

By the former reasoning it seems to follow that schools universally and entirely free are unsound, or at any rate dangerous schools. It is difficult to see how they can fail to blunt the sense of responsibility and the honest pride in self-support; least of all would they appear compatible with a mere voluntary attendance. Nor does it appear why they should not engender a low esteem of their benefits: what costs nothing soon counts for nothing: and the reason which the state stands for, seems clearly to demand that, so far as at all practicable, every beneficiary of public education should be made to feel its value by himself feeling in an effective degree its cost.

By the latter reasoning, it certainly follows that, beside liberal arrangements in the choice of local public schools, such as shall promote avoidance of too great risks in social contagion, private and select schools, especially for the younger children and for girls, must be authorized and even encouraged by the state. But it follows equally that these should all be subjected to the same conditioning and guiding legislation as the public schools. It is a prime duty of the state to make it certain that every school of a professed kind and grade is substantially equal to every other, be it public or private. Especially in the qualifications of teachers, as well as in the range and distribution of the subjects of instruction, should the state by legislative and executive action aid in securing a grade of excellence as high and as nearly uniform as the development of the age renders practicable. Indeed, in the regulation of attainments, conditioning the practice of all the learned professions, the state has an indispensable duty; and it needs to be acknowledged, to our regret and confusion, that in this duty our American governments, in comparison with those of other leading nations, are still discreditably derelict.

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III

HORACE MANN AND THE REVIVAL OF EDUCATION IN MASSACHUSETTS

Historic events are parts of historic movements, and historic men have built on foundations laid by forgotten workers. This was pre-eminently true of Horace Mann and the educational reforms usually associated with his name.

The first part of this century was marked by a general quickening of interest in education among enlightened thinkers and the friends of humanity the world over.

This interest resulted in an upward movement equally widespread. No classes were outside its influence, and in the grand sweep of its beneficence, in some of its many phases, it had touched and blessed all lands before Horace Mann had begun to think about the Massachusetts schools.

While the movement may be regarded as one—the same *Zeitgeist* stirring simultaneously many minds in many lands—it had two distinct phases; and each of these manifested itself in several different directions. The motive underlying one of these movements was philanthropy, and its object was to widen the sphere of school activities—to reach with the benefits of education neglected classes; the motive underlying the other was philosophy, and its aim was to improve existing institutions by broadening the courses of study, and substituting more rational methods of instruction and discipline.

A rapid survey of what was happening outside of Massachusetts during the first third of the century will prepare us to understand what happened in Massachusetts later.

To this period belongs the infant school movement. Started in 1800 by Robert Owen for the children of his employees at Lanark, fostered by Lord Brougham and other philanthropists, developed in London by Samuel Wilderspin,

it spread to all the centers of population. Infant School societies were everywhere organized. Purely charitable in their purpose, they took the children of the poor, between the ages of eighteen months and six years, and amid comfortable and pleasant surroundings furnished them with such elementary training as the parents were too poor and too negligent and too ignorant to supply. With similar purposes, and anticipating some of the methods of the kindergarten, they combined amusement with instruction, and moral with intellectual discipline.

Joseph Lancaster had set up his famous monitorial school in the Borough Road in Southwark, and, gathering a thousand children, had perfected his system of mutual instruction. Filled with enthusiasm, he had become an educational evangelist; had traveled through the United Kindgom lecturing and expounding his new system (which yet was not wholly new) with such success that monitorial schools became everywhere the rage. Within a few years there were fifty-seven of these schools in London alone, and more than a thousand in Ireland. They were in Sweden, in Switzerland, in Russia, in India, and Africa; and in 1825 Lancaster was in the new republic of Colombia, and Simon Bolivar, the Liberator, had appropriated $20,000 to found monitorial schools. While these charitable schemes for the most elementary education were flourishing, a most important movement was in progress at the other end of the line. At Glasgow had been founded a Mechanic Institute, which had been reproduced in all great manufacturing centers. The motto of these societies was a most suggestive one: "To make the man a better mechanic we must make the mechanic a better man." So it aimed by lectures, by evening classes, by libraries, and reading rooms, to give to men of limited opportunities the benefit of a scientific education—to fit the man for the century.

During this eventful period a still more profound movement was in progess on the continent. Rousseau's *Émile*, after being condemned to be burned by the Archbishop and Parliament of Paris, and subjecting its author to banishment, was

bearing fruit in the work of Pestalozzi and his disciples. Unlike the schemes of Wilderspin and Lancaster, which magnified devices—devices for organization, devices for instruction—the Pestalozzians were expounding and applying principles—principles which Bacon had announced two hundred years before, but which had found no reception in the schools. At the same time Jacotot was putting into practice in Louvain his methods of teaching languages, and Fellenberg was elaborating his complex Manual Labor School at Hofwyl. The air was full of educational novelties. From all countries philanthropic men and the ambassadors of kings were making pilgrimages to Iverdun and Louvain and Hofwyl. Curious travelers turned aside from viewing picturesque ruins and galleries of old masters, to experience a new sensation in seeing children at school and happy. Verily the word of the prophet was fulfilled, "A little child shall lead them."

The stimulus which these reforms gave to public thought was evidenced in the educational literature which began to be abundant. All phases of education were discussed, and discussed from new view-points, and with a deeper insight into the nature to be educated—domestic education, the education of girls, religious education, the education of the defective classes—the blind and the deaf—and out of it all national systems were evolving, which at a later day determined the fate of nations.

The influence of all this activity was felt on this side the Atlantic, and not one of all the schemes of the revivalists but found its patrons and its imitators here. Infant school societies were to be found in all the cities; Lancaster traveled through the United States, leaving everywhere something of his own enthusiasm, and the monitorial system became universally popular. Not only was it adopted for primary instruction, but for the older pupils in the reading and writing schools of the cities; and, following the lead of New York City, monitorial high schools were established in many places with the more advanced studies of the academies.

Joseph Neef, a coadjutor of Pestalozzi, opened a Pestalozzian school in Philadelphia, and published a descriptive book. In the same city, a disciple of Jacotot founded an institute to apply his principles. The manual labor ideas of Fellenberg found expression in some half dozen States. Still following the lead of the old world, the famous Franklin Mechanics' Institute was founded in Philadelphia, and similar associations began their beneficent work in other cities; educational books multiplied—reprints of European works, and many by native authors.

The publication of Warren Colburn's *Intellectual Arithmetic*, in 1823, was an efficient force in raising the standard of instruction. Previous to this all arithmetic work had been unintelligent ciphering. This book came into the schools as refreshing as a northwest wind, and as stimulating. It was eagerly seized upon by the more intelligent teachers. Its use was a mark of an intelligent teacher, a sign of life from the dead. Embodying the principles of the new education, it wrought a revolution in the teaching of arithmetic, and it determined the character of all subsequent text-books.

All these movements, though having in them the elements of progress, were comparatively local, and limited in the sphere of their influence. A few public-spirited men and women—some teachers—had come out into the light. But the great body of common schools remained unaffected. The great body of Massachusetts citizens was torpid so far as school interests were concerned, or, if aroused at all, awakened only to a spasmodic and momentary excitement over the building of a new chimney to the district schoolhouse, or the adding of a half dollar a month to the wages of the schoolmistress.

Nor was this lethargy of the people and this decay of primitive ardor more marked in New England than in other countries where the spirit of the Reformation had early set up school systems. Scotland, in 1819, awoke to the fact that the parish schools, in which a century before she had led the world, had fallen into decay; had so failed to maintain the

standard of popular intelligence which had made the Scotch leaders of thought, that half the people in the Highlands could not read. In Holland, too, the primary schools of the Reformation had become what the Highland chief called "cemeteries of eddication!" The free school system of Massachusetts, under her compulsory laws, had kept her from sinking to the level of the parochial systems of her Calvinistic sisters.

To James G. Carter of Lancaster, Mass., belongs the honor of first attracting public attention to the decadence of the public schools, the extent of it, the cause of it, and the remedy for it. Within a year after he graduated from college he began an aggressive campaign in favor of free schools, which he continued for seventeen years, until his triumph was complete in the establishment of the normal schools, and Horace Mann came to follow up his victory.

His first efforts were through the press. He described the condition of the public schools; he showed how they had sunk in the character of their instruction and instructors; with convincing logic he showed how the academies and private schools were largely responsible for this decline; in eloquent terms he painted the wisdom and self-denial of the founders of the State, and contrasted it with the degeneracy of their children; and with the ardor of his age, and a sagacity and insight beyond his years, he argued for inductive teaching in all the schools, and proved conclusively that there could be no such teaching until competent teachers could be provided. Then, rising to the height of his subject, he outlined a plan for a seminary of teachers, of which Professor Bryce said, in 1828, it was "the first regular publication on the subject of the professional education of teachers which he had heard of."

Mr. Carter's plans for school improvement included two means as of primary importance: a school fund, and a seminary for the training of teachers. The efforts of the friends of reform to secure these two ends were unremitting. The measures were forced upon the attention and consideration of the legislature every year from 1827 until opposition and

reluctance yielded to importunity and both were secured. In 1834 a bill was reported and enacted establishing a school fund.

Three years later Mr. Carter's enthusiasm and energy achieved another signal triumph, and the Commonwealth took the second step in its educational renaissance. In his address at the opening of the legislative session in 1837, Governor Edward Everett recommended the creation by law of a Board of Education as an efficient means of furthering the educational interests of the State. In the face of vigorous opposition the measure was carried, and a board of eight members was created, to be appointed by the Governor and council, one member to retire annually, the Governor and lieutenant-governor to be members *ex-officiis*.

This measure was a very mild and inoffensive one. It was evident that the State intended to lay no violent hands upon the people's schools. The new board had some simple duties, but no power. It was to prepare an abstract of the school returns; it was to make an annual report to the legislature of the condition and efficiency of the common school system, and to suggest means of improving it; only this and nothing more could the board do. Its mission was to influence by enlightening, not to control by authority.

That this influence might be most widespread and potent, the board was authorized to appoint a secretary, who should, in the words of the act, "collect information of the actual condition and efficiency of the common schools and other means of popular education, and diffuse as widely as possible throughout every part of the Commonwealth information of the most approved and successful methods of arranging the studies and conducting the education of the young, to the end that all children in this Commonwealth who depend upon common schools for instruction may have the best education which these schools can be made to impart."

The board was to enlighten the legislature—its secretary was to enlighten the people. Inasmuch as the legislature came from the people, it is evident that whatever efficiency

there was to be in the new measure would be the personal efficiency of the secretary; the outcome of the new departure, in direction and distance, would be determined by his wisdom, zeal, and popularity. The possibility of progress was coextensive with the power of the secretary to make himself solid with the people.

At the first meeting of the board, June 29, 1837, Horace Mann was chosen secretary. The choice was a surprise and a disappointment to many of those who had been most active in promoting the new movement. They wanted James G. Carter. It was his voice and pen which for seventeen years had been kindling public sentiment and guiding it toward this consummation. It was his portrayal of the decadence of the common schools, his keen-eyed discernment of the influence of the academies, his eloquent appeals to the sacrifices of the fathers, his sagacious and far-reaching plans for improvement, his skill in legislation which had set the reformation on its feet. He had been the acknowledged leader out of the wilderness into sight of the promised land. It seemed hard that he should not go over and possess it.

If Mr. Mann's qualifications for the position were not peculiar nor pre-eminent, they were neither few nor inferior. Supreme among them was his moral earnestness. In considering any question his mind instinctively turned to its moral aspects; all subjects for him were shadowed by the eternities. In this he was a Puritan of the Puritans. The Puritan spirit was manifest also in his readiness to take the field in defense of principles or in support of measures which he had espoused. He was born to be a champion. Fearless of consequences to himself, he had the stuff that martyrs are made of.

He was broadly humanitarian in his sympathies. He had already shown this in carrying through the legislature almost single-handed the bill to establish the first Asylum and Hospital for the Insane in Massachusetts. He was one of the firmest friends and strongest helpers of Dr. S. G. Howe in carrying on his work among the blind, and he was in the van in the fight with slavery and intemperance.

On the intellectual side his legal training had developed certain natural characteristics; his mind was at once broad and keenly logical. As a result of this no subjects presented themselves to him alone and unrelated; they readily referred themselves to categories, and came under great general principles. From the combination of these two qualities—moral and intellectual—it came about that, whatever cause he espoused, he lifted the discussion at once to the most elevated plane, giving to it a breadth and a dignity which appealed to the thoughtful men and women of the time. This was the secret of his power and of his success. His imagination was active and strong, his idealizing power great, yet there was a practical element in his make-up which kept him from quixotic undertakings; he never mistook sheep for soldiers, nor tilted against windmills.

His writings were characterized by a wealth of language, aptness, and variety of illustration, and an elaboration of argument sometimes bordering close on prolixity and tediousness, but in controversy he could be keen, witty, vigorous, overwhelming. In public speech his arguments were convincing, and his eloquence inspiring.

Besides these qualities of character, his previous life was an added qualification for his new office. He had been for ten years in the Massachusetts Legislature, and during the last two of these he had been president of the senate. This gave him a wide acquaintance among leading men in all parts of the State. He had been one of a commission to prepare the Revised Statutes of 1836. All this gave him a prestige which a mere schoolman could not have had. In politics he was a Whig, in religious faith a Unitarian. These were elements both of strength and of weakness in his new position, as will appear later.

With such endowments, natural and acquired, Mr. Mann accepted the office of Secretary of the Board of Education, June 30, 1837, and on the evening of that day he wrote in his journal, "Henceforth, so long as I hold this office, I dedicate myself to the supremest welfare of mankind upon earth," and

for twelve years he held himself to the full level of that vow.

His friends and the public were surprised that he should consent to leave his profession, which might be lucrative, and to withdraw from political life, where preferment was certain, for an office whose salary was meager and whose title conveyed the idea of service, but not of honor. Concerning the title he wrote: "If the title is not sufficiently honorable now, then it is clearly left for me to elevate it; I had rather be creditor than debtor to the title."

Whatever Mr. Mann at the time of his appointment lacked of information, within a few months he knew more than anyone else had ever known about the Massachusetts schools. For diffusing this information, and for arousing and directing public opinion, three means were used: first, conventions and other public meetings; second, the annual reports which the law called for; and third, the *Common School Journal*, a monthly periodical which Mr. Mann established, and conducted for ten years. By these three means he aimed to reach and influence all the parties on whom the success of the schools depended—the public, the school committees, and the teachers.

In annual conventions held in each county, to which teachers, committees, and all friends of education were invited, and to which the towns were requested to send special delegates, Mr. Mann delivered an address in which he discussed, in a broad and general way, great educational topics, treating them with that wealth and felicity of illustration, that elaboration of argument, and that lofty eloquence which characterized his treatment of all great themes.

His first lecture was on the means and objects of common school education, and struck the keynote of all his subsequent labors. While no man had a truer appreciation of the value and need of the higher education, nor exhibited in his own work more of its fruits, yet his accepted mission was to be the apostle of the common schools. In an age of invention he declared, "The common school is the greatest invention of

man," and he sought by all the means in his power, on the one hand to increase its efficiency, and on the other to win back to it public confidence and support.

While Mr. Mann in his annual convention lectures treated educational subjects in a more general and discursive way, in less formal meetings he treated of specific evils, and pointed out the remedies. This he did, too, through the medium of his annual reports, which stand to-day unexcelled as educational documents for the range of subjects—general and special; for the treatment—so broad, so philosophical, so wise and so practical, that as we read them in the light of a world full of new educational literature we wonder how a lawyer came to know so much of the theory and practice of education.

In his reports the secretary dealt more directly with facts, and used the returns from the towns as a basis for argument and appeal. The fact which overtopped all others in significance, and which was supremely worthy of interest, because a cause of justifiable alarm, was the non-attendance of children at schools of any kind. It appeared from the returns that more than forty-two thousand children did not attend school at all—or attended so little as not to be counted; while those who were counted attended on the average but seventeen weeks in the year. The money that should have been used to secure a full measure of schooling to all the children, had been diverted to the use of the few to the neglect of the many. The people were paying seven-tenths as much money to educate one-sixth of the children in private schools as they were raising by tax to educate the other five-sixths in public schools.

With this fact and this peril before them, Mr. Mann appealed to the people as patriots, in a convention lecture, on the necessity of education in a republican government. In his Fifth Report he appealed to them as practical business men, by showing the advantages of education over ignorance in promoting the industrial welfare of a community; and in his Eleventh Report he appealed to them as Christians, by

showing the common schools to be the most effective instrument to deliver the people from vice and crime.

Not only were the common schools poorly supported and scantily attended, but the schoolhouses were a menace to the health of the children, and a disgrace to the communities which owned them. In his first year of service Mr. Mann prepared a special report on schoolhouses, containing plans and detailed suggestions for proper sites, size, arrangements, furniture, heating, lighting, and ventilating.

The third count in the indictment was the absence of any adequate supervision. The town committees, who were to have the general charge and superintendence of the schools, thereby averting the evils of the district system, in many of the towns had no pay for their services, and rendered no service. In a town of forty districts the committee had not examined a teacher nor visited a school for eight successive years. And the people loved to have it so. Mr. Mann urged the people to greater care in the selection of committees, and to pay them adequately; and he instructed the committees in their duties in visitation, in examination of teachers, and in selection of text-books.

While working thus with the people he was working with no less assiduity and skill to improve the internal economy of the schools, both in matter and method, both in work and in spirit. His Second Report is a most interesting and instructive treatise upon the teaching of reading, including a sweeping and just arraignment of existing school readers, and suggestions for reading matter better adapted to be instruments of instruction in the art of reading, and means of true literary culture. He urges the advantages of teaching words before letters, of written rather than oral spelling. He advocated everywhere objective methods of instruction, the teaching of ideas before words, the use of illustrative apparatus and experiments. He dwelt at length upon school motives and government, and urged the use of moral measures in place of the indiscriminate and universal use and abuse of corporal punishment. He endeavored to broaden the concep-

tion of education, and brought more directly before the people than anyone had done before the need of physical and moral as well as intellectual training.

After accepting his office of secretary he had read and absorbed the treatise of the Edgeworths dealing with education on the practical side, and of George Combe on the theoretical side. So he presented to the people and secured a hearing for all the characteristic features of what has come to be known as the new education—its spirit and its methods.

The crowning work of this new era was the establishment of the normal schools. Toward this consummation many men and many influences contributed. The battle had been fought and nearly won before Mr. Mann became an educational leader. Other men labored, and he entered into their labors. But it fell to his lot to be present at the birth, and to watch over the infancy of these schools, and never did feeble nurslings have more sympathetic and more solicitous care. He selected the first principals, made out the first plan of organization and instruction, and they stand for all time inseparably associated with his name and work.

At the close of the year 1848 Mr. Mann gave up his work as secretary, having accepted a seat in congress as the successor of John Quincy Adams. During these twelve years of Mr. Mann's labors the appropriations for public schools had doubled; more than two million dollars had been spent in providing better schoolhouses; the wages of men as teachers had increased sixty-two per cent., of women fifty-one per cent., while the whole number of women employed as teachers had increased fifty-four per cent.; one month had been added to the average length of the school year; the ratio of private school expenditures to those of the public schools had diminished from seventy-five per cent. to thirty-six per cent.; the compensation of school committees had been made compulsory, and their supervision was more general and more constant; three normal schools had been established, and had sent out several hundred teachers, who were making themselves felt in all parts of the State.

All these changes, great as they were in themselves, had their chief significance as indications of a new public spirit. The great work which had been accomplished had been to change the apathy and indifference of the people toward the common schools into appreciation and active interest. This once secured was a guarantee of future progress, and with it nothing would be impossible.

In achieving this result Horace Mann's pre-eminence is indisputable. Much had been done before his time; some men had come out into the light; truth had been preached; converts had been made; far-seeing men had projected far-reaching schemes. But the great body of the people of Massachusetts were as unmoved by all that his predecessors had done as the depths of the ocean are unmoved by the winds that agitate its surface.

Mr. Mann was not an original thinker along educational lines; he read, observed, absorbed, and then gave out. For fifteen hours a day for nearly twelve years, without a day for recreation, he gave himself to the work of convincing and moving the Massachusetts public. He sowed beside all waters.

It is for this reason that popular opinion has come to associate all modern educational reforms with the name of Horace Mann. He is thought to have been the father of normal schools, of high schools, of graded schools, of methods of teaching; the destroyer of the district schools and the academies. By some he is honored as the "Morning Star of the Reformation," by others he is esteemed an iconoclast and a vandal. He was neither; he was a voice crying in the wilderness; and men did hear, and did heed, and did respond. Not readily, nor universally. The story of his labors reads like a chapter in the Acts of the Apostles, so disheartening was the coldness, so varied and persistent the opposition.

Many of the conventions were small and spiritless. This was especially true in the autumn of 1840, when political excitement ran high, and the people—even the best of them—went by the doors of his meetings in throngs to attend Log Cabin

and Hard Cider rallies in distant towns. Not that they had anything against Mr. Mann; on the contrary, had he been—as in earlier days—an active participant in these political movements, they would have flocked to hear him. It was this very indifference to the cause which he had espoused which wounded his sensitive spirit; so he writes in his journal, "A miserable, contemptible, deplorable convention"; again, "Politics are the idol which the people have gone after, and the true gods must go without worship. . . If I were not proof against slights, neglect, and mortification I should abandon the cause in despair."

Nor was active opposition wanting. The most serious came from the legislature, the most contemptible from the religious press, the most humiliating to the friends of education from the schoolmasters.

The State election of 1839 was signalized by a political overturn, by which the oft-defeated Democratic candidate for Governor, Marcus Morton, was elected by a majority of one vote, and the Whig ascendency in the legislature was broken. Governor Morton, in his inaugural address, without directly attacking the Board of Education, by innuendo opened the way for his followers in the legislature to a direct assault. He suggested that to those nurseries of pure democracy—the town and district meetings—should be left the control and care of the common schools. A committee on retrenchment, acting on this hint, went out of its way to recommend the abolition of the board, declaring that instead of a State board there should be a Board of Education in every school district, and that that board should be composed of the fathers of the children.

The matter went to the Committee on Education, from which came a majority report recommending the repeal of all legislation establishing the Board of Education and the normal schools, and the refunding to Mr. Dwight of the money contributed by him. The board was assailed in this report rather for what it might do than for what it had done, for its centralizing tendency—a tendency to acquire con-

trolling influence over the school interests of the State. It was charged with trying to Prussianize the schools, and to substitute for the democratic principles of the past the arbitrary methods of European despotisms, with being an ingenious instrument for crushing the liberties of the people. The district libraries approved by the board were a menace to the moral and religious interests of the State, because they contained no sectarian books. The normal schools were unnecessary and useless. The academies and high schools could furnish all the teachers needed, and they cost the State nothing; anyone who had been well instructed could instruct others.

A minority of the committee, consisting of only two members, presented a counter report which showed so clearly the illogical and absurd position of the majority, and defended so ably the Board of Education and its measures, that it secured the approval of the House. The opposition was defeated by the decisive vote of 252 to 182. The period occupied by the discussion was perhaps the most anxious time that the friends of educational progress in Massachusetts had ever experienced. And not in Massachusetts alone; in New York and Connecticut reactionary movements had already been successful, and defeat in Massachusetts would have been a national calamity.

Mr. Mann's pronounced Unitarianism made him, from the first, an object of suspicion to many of the people calling themselves evangelical. The loss of Harvard College to orthodoxy, and the wholesale looting of the old churches which had accompanied the Unitarian schism, led the older denominations to fear that the Board of Education was merely an instrument, contrived under plausible pretexts, to bring the public school interests of the State under Unitarian control, as the college had been brought. They saw in the normal schools, under Mr. Mann's direction, a most insidious means of filling the schools with Unitarian teachers, and in the district libraries—with their claim to be non-sectarian—a device for poisoning at the fountain the minds of the people.

So the denominational papers kept up a running fire of criticism, seconded all the hostile efforts in the legislature, and opened their columns to the most malignant personal attacks. While Mr. Mann hated orthodoxy as much as the orthodox distrusted him, yet the consciousness of sincerity and singleness of purpose in his educational work sustained him through all this annoying experience.

The story of this period of revival would not be complete without a notice of the attitude of the teachers themselves.

Mr. Mann's Seventh Report consisted of a description of European schools as he had seen them in a tour of inspection just completed. This report was made the pretext for an attack upon Mr. Mann by the masters of the Boston grammar schools, thirty-one in number, in a pamphlet of 144 pages.

In this document the masters accused Mr. Mann of ignorance of education in general, and of the Boston schools in particular; of bearing false witness against the schools of Massachusetts, in order to magnify his own work as a reformer; of hasty conclusions from scanty observation. They minimized the value and the work of the normal schools; and then, selecting three subjects—oral instruction, the teaching of reading, and corporal punishment—proceeded at great length to antagonize the views of Mr. Mann. The whole document was a confession of weakness and fear by men who felt the ground slipping from beneath their feet; who were conscious that if the principles and methods advocated by Mr. Mann should obtain general acceptance their own days were numbered; if the world should move in that direction they must be stranded.

Mr. Mann replied to this pamphlet; the masters replied to his reply, and he returned again to the attack, while a guerrilla warfare of pamphlets was waged by partisans of the principal combatants.

This opposition from within the educational ranks can only be explained on the theory of Dr. Harris, that the profession of teaching tends to make men conservative. The necessities of instruction compel the teacher to reverence what is known

—what is fixed—and to be suspicious of the untried. Occupied in restraining the eccentricities and vagaries of childhood, his first instinct is to oppose the new as visionary and fantastic. Charitable as this philosophy is, this opposition of teachers, this wounding of the cause of education in the house of its friends, was most harassing and discouraging to Mr. Mann. Time which he might have spent in furthering the cause or in needed rest and recreation, was used in repelling enemies or in quieting the apprehension of friends.

When we set ourselves to measure the work of Mr. Mann, all this must be taken into account. He fought the battle of educational reform in Massachusetts through to the end, and conquered. Apathetic indifference, hidebound conservatism, niggardly parsimony, sectarian bigotry, and political animosity surged around him, as the enemies of France surged around the white plume of Henry of Navarre, but he left the field so clear that since his day none of these reactionary forces, singly or combined, have made any successful opposition to the on-going movements of the cause of popular education.

To the vigor, the skill, the self-sacrificing ardor, and the conscientious rectitude with which he conducted the offensive and defensive campaigns of his official life, is due the fact that Massachusetts has suffered none of those educational reverses which have befallen most of the other States. The school children of Massachusetts made no mistake when they placed in front of the Capitol of the State a statue of Horace Mann as of their benefactor and their ideal.

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IV

A WORKING BASIS FOR THE CORRELATION OF STUDIES

It is conditions rather than theories that induce men to take up active reforms. Though the logical need of reforming our curriculum of studies has long existed, it is only recently that such a condition of affairs has appeared as to render it imperative. Our programme of studies has become badly congested with subjects representing all sorts of popular demands, social reforms, and esoteric professional interests. Each subject has pushed for further and further recognition, quite independent of the demands of other subjects, or the needs and capacities of the pupils, until the need for elimination of non-essentials and the correlation of essentials has become pressing. As practical manifestation of this necessity, President Eliot's efforts to secure a rational programme for the grammar school led to the appointment of the nine mid-winter conferences on the subjects for the elementary and secondary schools, as follows: viz., on Latin; Greek; English; Other Modern Languages; Mathematics; Physics, Astronomy, and Chemistry; Botany, Zoölogy, and Physiology; History, Civil Government, and Political Economy; Physical Geography, Geology, and Meteorology. At least seven of the given groups have their presuppositions far down in grammar and even primary grades. How, for instance, can we have a good high school course in English, mathematics, history, or geography, whose foundation is not properly laid in the earlier grades? To illustrate this still further, the Madison Conference on History, Civil Government, and Political Economy has no doubt recommended to the grammar school at least three or four years of preliminary work in history. Doubtless similar recommendations have been

made by many of the conferences on other subjects. We begin now to see a practical and objective need for correlation quite independent of any psychological reasons. The result of each conference will be, in large measure, a report of specialists, and each will have hovering before it a curriculum in which its own group of subjects shall be the leading idea. It is not unreasonable to expect that each will claim more time than can, in justice to the pupil and other subjects, be granted. The second question for the conferences to answer is as follows: "After a subject is introduced, how many hours a week for how many years should be devoted to it?" It is not improbable that the aggregate number of hours demanded will considerably exceed all there are in the school week, leaving the child no time for play or study during school hours. When one considers the time demanded alone one sees, therefore, that the appointment of a committee on correlation, at the recent superintendents' meeting at Boston, was a necessary step.

Questions 4 and 5—"What topics or parts of the subject may reasonably be covered during the whole course?" and "What topics or parts of the subject may best be reserved for the last four years?"—are, as may be seen, questions as to the selection and sequence of topics for each subject. Now, if there is to be anything more than an external and mechanical adjustment of the various parts of the various subjects, it is evident that there should be some common principle or principles of sequence observed throughout the curriculum.

Broadly speaking, one may follow the logical unfolding of the various subjects considered as finished wholes, as a guide to the sequence of topics, or one may be guided chiefly by psychological considerations, such as appear in the natural interests and capacities of the growing child. Since no real progress can be made in correlation of studies until one is fairly clear on this subject, I invite attention to a preliminary discussion of it.

LOGICAL VS. PSYCHOLOGICAL ORDER IN STUDIES

To scientists or other scholars the subjects taught in the schools are like full-grown oaks—they exist in their developed state as completed wholes. Each part has its proper place, each performs its appropriate function with respect to other parts and the whole, while all the parts are present at the same time, whatever may have been the original order of their appearance. So far as the knowledge to be imparted in the schools is concerned, each subject may be said to be a complete whole. It is a system of human knowledge that has been already developed. What has been discovered respecting it has been reduced to a system in which each element finds its appropriate place. As an illustration of what is meant, suppose we think of what has been learned in the field of animal life. All this vast accumulation of facts has been duly organized, and the relation of each particular to every other has been scientifically determined. Now in any such organization of knowledge some logical order must be determined upon. This order will vary according to the standpoint of the organizer. With the evolutionist there is but one logical order, and that is the order of supposed development. Accordingly, we find a systematic arrangement, beginning with the lowest orders of one-celled animals. Arithmetic, likewise, or mathematics in general, exists as a developed system, and as such has a certain logical order or sequence of parts.

To the child, standing at the portals of the school, none of these departments of learning are developed wholes. If to the teacher they are like full-grown oaks, to the child they are like acorns, which must grow from very small beginnings to whatever they are to become. Now, in such a case, when a subject, however complete it may be in the mind of the teacher, must *come to be* in the mind of the child, where the elements do not lie ready-made side by side, but where one must follow the other in time, the question naturally arises: Is the logical order of the complete science as the teacher knows it the psychological order as the child must learn it?

In illustration of this question we may ask if the logical order of evolution is the psychological one for beginners in the study of biological sciences. Ought children of the primary or grammar grades to begin by studying the simplest forms of the protozoa? Suppose we say, "Yes, this is the logical order in the subject, and what better guide can one have for teaching it?" Let us see if any difficulties arise. In the first place, a new and strange instrument of observation, the microscope, must be used. At first it would be a novelty and hence interesting, but the interest would be transient and not really connected with the subject of study. In the next place, the child would be set to studying something entirely out of relation to his former experience, so that apperception could have but a feeble chance of establishing important relations between the undifferentiated forms under the microscope and the body of knowledge already acquired by the child. To the veteran microscopist barely perceptible spots on the slide might induce the greatest mental excitement, because of the significance they are seen to have in verifying a theory or in opening up an unknown field, say in medical science. To the child who does not possess even the rudiments of scientific interest such spots would have little more significance or interest than so many fly specks. All such attempts fail of necessity, because they ignore the laws of apperception; they take no account of the interpreting knowledge of the pupil, or of his natural or acquired interests.

It is in mathematics, perhaps, that the logical order of the developed subject comes nearest to being the pedagogical order for the learner. It must, finally, suffice to say that the pedagogical order of the various parts of a subject of study should be determined, primarily, in view of the pupil's apperceiving capacity, his knowledge, and natural interests, and only secondarily by the logical order of the developed science. It is in this respect, practically, that President Eliot impeaches the present curriculum. He charges the grammar school with taking far more steps in mathematics than a pedagogical order of development of the subject demands, thus wasting

time, and boring the pupils to death with tedious superfluities, which, though perhaps having a place in the logical order, have yet none in the pedagogical one.

PURPOSES OF CORRELATION

But even when the validity of the psychological principle of sequence is admitted, we are still far enough from any effective correlation of studies, since each study may be allowed to pursue its own path quite independent of the others. Geography, for instance, may be taught in complete isolation from history on the one hand, and from botany, zoölogy, and commerce on the other, though it has in reality intimate relations with all of them. It is evident that a correlation of the branches named would seek to bring really related parts into such juxtaposition in the curriculum that the more obvious relations might be brought to the consciousness of the child.

The method and extent of our correlation will evidently depend upon the ultimate purposes we have in attempting it at all. Perhaps our leading purpose is merely the practical one of saving time by preventing unnecessary duplication, and by eliminating non-essentials. This is undoubtedly a worthy motive for co-ordination. It may be that we seek to stimulate the child's interests and efforts through the added intellectual pleasure that comes from discovering the causal or curious relationships between phenomena apparently independent. Thus to discover the causal relations that exist between physical configuration of the land and animal life or historical events, lends a new delight to study. Our design may perhaps extend to the further effort systematically to develop the apprehending power of the mind by building up in every widening outlook an apperceiving power, bringing to consciousness the chief relations that exist in reality. Understanding and thinking might be defined as the apprehension of relations, so that if a proper correlation of studies will bring to view many important relations that would otherwise remain hidden, it is only rational to suppose that the appre-

hending power of the pupil will be greatly augmented by suitable correlation. We may finally, like Ziller, seek to direct and develop the whole moral disposition of the child, making this aim our sole guide for the unification of the studies.

GERMAN EFFORTS—THEIR DEFECT

Ziller and his disciples in Germany have attempted a systematic co-ordination of the whole curriculum, on the idea that the development of character is the chief function of the school, and on the psychologico-historical principle that every child in his mental development passes through the same evolutionary stages that the race has manifested in its upward movement. According to this idea the subject matter of instruction best fitted for a child at any given period of his life must be chosen from the classic writings left by the people of the historical epoch most exactly corresponding to his present stage of development. This can, perhaps, be made to work in the case of those departments of learning in which any records have been left, namely in literature, history, and perhaps in language and fine arts, but it can evidently have little or no reference to the natural sciences, which have been developed in recent times. Ziller's device to avoid this difficulty is to make the humanistic group, comprising history, literature, and language, the leading studies, and then to associate the others with them as well as may be. Thus, for example, while the first grade pupils are learning the twelve Grimm's *Märchen*, or fairy stories, proposed by Ziller, they at the same time study the animals and natural phenomena mentioned therein. In connection with the Star-Dollar story, object lessons on the following subjects are given: The schoolroom, the bed, clothing, food, the garden, the field, the wood, the heavens, directions, and the schoolhouse. In the second grade, where the story of *Robinson Crusoe* furnishes the literary basis of the curriculum, we find such topics as the following treated: The Hörsel, the Werra, the Weser, and the sea; pond, canoe, boat; house structure and outbuildings; money; divisions of time; fire and light;

the cabinetmaker; the neighboring landscape; forest trees; meadow and meadow flowers; forest birds; the basketmaker, and so on, each topic being connected with some incident in the story of *Robinson Crusoe*. But in the third and fourth grades, when the science work begins in earnest, there is a practical abandonment of the attempt at a close correlation of humanitarian and nature studies, though the semblance is still preserved. It seems to lie in the nature of the case that the attempt to connect every natural phenomenon with some humanitarian subject having ethical content is foredoomed to failure, or can at best but yield a poor semblance of moral training. The solution of this problem as it presents itself to-day must surely be wrought out on somewhat broader lines. Ziller's plan is not co-ordination of studies, but subordination of all other studies to those having a distinct ethical content. In this connection it may be incidentally remarked that *Robinson Crusoe* is taught in the second grade ostensibly as the center of the ethical group, whereas it is not essentially ethical, but economical. It develops in reality the industrial instincts of the child, while the ethical element is dragged in or magnified out of all proportion in order to fit an artificial scheme of co-ordination. I am persuaded that the effort to attach a moral to those things not inherently moral in their nature is harmful rather than beneficial, and that character is not promoted by perpetual tinkering on the part of the teacher. Nor, on the other hand, can we hope to secure a philosophical unity of knowledge in the mind of a child. Such a thing is not only undesirable, but impossible. What we may hope to do is to arrange the programme economically both as to time and effort demanded. We may greatly enhance interest and apprehending power by bringing constantly into the child's consciousness the minor unities and relations that lie close at hand, and for whose grasp he is entirely capable; and we may indeed favorably affect the pupil's whole volitional life by revealing more clearly the intimate connections that should exist between knowledge and action.

PROPOSED PLAN OF CORRELATION

Instead of proposing, then, as Ziller does, one central core of instruction, namely literature, history, and religion, to which all other branches shall be subordinated, clinging to it like iron filings to a magnet, I propose three co-ordinate cores, or centers, of unification, and one universal correlating study binding them together.

The first core is the humanistic group of studies having a distinct ethical content in literature and history, and a historical development arising from human progress through different stages of civilization.

The second core is the group of nature studies having no specific ethical content and no long progression from primitive to higher and higher truths, since these studies are the results of but one stage in civilization, and since all progress in science has been rather a succession of leaps from error into truth than a gradual development of truth. Alchemy preceded chemistry; astrology, astronomy; and the Ptolemaic mistake, the Copernican accuracy.

The third core represents the two factors man and nature in interaction, and may, in the absence of any accepted term, be called the economic core. On the one side it shows the modifications needful in nature to fit it for the uses of man, and on the other it trains man directly to enable him more fully to utilize nature.

The universal study that is to bind these three cores together into a co-ordinate whole is geography. It is at once a study of the physical basis of science, a consideration of the seat and conditions of man's ethical and political progress, and a practical exemplification of how man realizes his power in economic functions and development.

THE HUMANISTIC CORE

However much our ultimate theories of education may differ, I think it may fairly be asserted that in elementary education our best thinkers unite in the opinion that concrete, interesting matter is far preferable to the dry bones of purely formal

and mechanical instruction. In place of the old motto of discipline *and* knowledge we have really adopted in practice the new one, viz., discipline *through* knowledge. Furthermore, the present almost universal interest in ethical training leads to the conclusion that our former standpoint of mere intellectuality in school education is being gradually shifted to one that takes far more cognizance of the need of developing moral character. From these facts I am encouraged to believe that the proposition to make literature and history one core of unification, with which more formal studies may be associated, will be received as seasonable and practicable.

In the studies of this core, and with proper limitations, Ziller's principle of following in the main the chief epochs of civilization is a workable one. Literature should begin with the fable, which is of Asiatic origin, and which presents the economic or utilitarian standpoint of action. The fables represent virtuous action as paying larger dividend of pleasure and advantage than vice or wrongdoing. These should be accompanied by folklore and fairy tales, which have taken their origin in the primitive stages of society, and which introduce moral ideas as ends of action. From here on the literature should show, in gradually broadening relations, the chief situations in which the individual may stand to organized society. Alongside of this ideal presentation of human action and its results should stand the historical, and by following a like principle there will be no serious difficulty about unification. Early history will begin with mythology, which will easily blend with the early literature, and will proceed to biography, which will assume largely the literary coloring in the mind of the child. This will gradually merge into history proper in the upper grammar grades.

Human deeds both actual and ideal are the expression of ethical forces, but language is necessary for their preservation and transmission. Language study becomes, therefore, merely the formal aspect of literary and historical study. In the elementary grades it is the mother tongue that we must deal with, so that a sufficiently close co-ordination with these

studies may easily be brought about. Language lessons and reading grow naturally out of these subjects, to say nothing of their equally close correlation with nature studies.

In my view, therefore, the literary and historical treatment of the deeds of men, together with the literary aspects of nature, such as are represented in John Burroughs's admirable books, forms naturally the core for all direct efforts at ethical training so far as such training may be presumed to be based upon the curriculum, at the same time forming a core about which the more formal language work may be associated.

THE SCIENTIFIC CORE

In the case of nature studies, the leading purpose and unifying principle must be presumed to be scientific rather than ethical in the narrower sense of the term. That it may be clearly understood in what sense science is or is not ethical, we should clearly distinguish between an ethical instrument and an ethical content. It is quite possible to give a boy a training in science that shall be ethical in a high degree, since he may be taught to be careful, diligent, painstaking, and truthful in all his mental operations. Blacking boots or sawing wood might also yield the same ethical lessons, yet we should not ascribe ethical content to the blacking, the brush, the wood pile, or the saw. It is the boy's action that has the ethical quality, and in this case the things used are only the instruments of an ethical deed. In the same way science studies have a high value as instruments in the training of character, but since their content is scientific, material fact, having no quality of good or bad will, they certainly are ethically quite indifferent. Whereas, then, the content of literature and history is ethical, since these exhibit the good or bad will of men, the content of nature studies is in the last analysis non-ethical or scientific, since it pertains solely to the facts and laws of nature.

For reasons already given it is clear that the historical principle has little or no applicability to this group of subjects. We must therefore find other and more practicable

bases for unification. It can hardly be said that scientists themselves are a unit as to what should constitute the proper selection, sequence, and correlation of topics in nature studies; indeed, not very much thought has been given to the subject. Twenty years ago teachers were declaring that science has small value for education or discipline in any field. Its knowledge value was conceded, but since nearly all sought to teach it in accordance with the methods common in languages, mathematics, and philosophy, its own peculiar excellence as an instrument in education did not appear. In the higher education all this has been changed, so that science is now valued by liberal-minded men as much for its educational discipline as for its useful information. Science has become a clear exemplification of the principle of discipline *through* knowledge. The most, perhaps, that we can claim regarding nature studies in elementary grades is that men are now ready to grant the priority of psychological grounds in sequence of parts and co-ordination of branches. The tendency has been to a tandem arrangement of subjects and a logical sequence of parts. This position has been, or is destined to be, abandoned. Mr. Jackman in his most suggestive little volume on *Nature Studies* fully accepts the psychological needs, and the opportunities of season and situation as a guide to selection and arrangements. In the month of September he offers topics from zoölogy, botany, physics, chemistry, meteorology, geography, and geology, though not requiring a consideration of all of them. He says, "Nor is it so important, as many teachers suppose, to use the material afforded by any particular subject in a fixed order. In zoölogy, for example, it matters not the least whether the child begins with a vertebrate or an invertebrate, provided in that particular thing there is something which he wishes to study. In botany it matters not whether it be a fungus or a flower that opens up this great kindgom of life to him. The mistake made on this point by teachers is a fundamental one, and it lies in supposing that those objects which are physically near to the child are the only ones which have a psychic

nearness to him. A bright butterfly, or even an oyster, is much nearer, psychologically, to the child than a house." "In disposing of this difficult question of arranging a course of study, and selecting suitable material," he continues, "the teacher must take his cue from nature and from his own immediate surroundings. The work should therefore be planned to suit the changing and recurring seasons."

The practical elaboration of the selection, sequence, and correlation of topics in the nature studies must be intrusted to the thoughtful leaders in this field. Illinois science teachers, led by Professor S. A. Forbes of the University of Illinois, have been working at the problem for some three years.

Just as language constitutes the formal aspect of humanistic studies on the one hand, so mathematics is the formal aspect of nature study in its quantitative relations on the other. Our elementary work has heretofore been practically divorced from any considerable concrete matter, and taught chiefly as an abstraction. Now while nothing can make mathematics easier than it is by nature, much can make it easier and more interesting than it has been in practice. Professor Jackman points out that about the only concrete matter we have used has been the idea of value. That there is a much wider range of concrete data that may be used, connecting number with many aspects of nature, he shows theoretically in his recent article in the EDUCATIONAL REVIEW,[1] and more fully and practically in the last report of Superintendent Bright of Cook County., Ill., which contains the most thoroughgoing attempt at correlation of studies that I have seen in English.

THE ECONOMIC CORE

The third core of instruction, which I have called the economic, has been but partially recognized in our course of study. Since it deals with a double-sided relation, that of nature to man and that of man to nature, there are two sides to a curriculum logically correct in this respect. One is the

[1] EDUCATIONAL REVIEW, V: 35.

direct physical training of the child for mastering and utilizing the forces of nature, and the other is the more contemplative study of the actual manifestations of nature, such as are seen in industries, commerce, agriculture, and the like, for the uses of man. The first of these two sides is the very important practical education now known as manual or industrial training, and the second is the imaginative view brought to light through literature, re-enforced by the commercial, social, and political aspects of geography.

Not being a specialist in manual or industrial training, I cannot speak authoritatively as to the best principle of sequence, but imagine it will depend mostly upon psychological and other practical grounds. It is evident that no sequence, however philosophical in itself, can be adopted that plainly transcends the capacity of the schools with respect to teachers, materials, or appliances. In the model department of the Cook County Normal school, cardboard Sloyd occupies the first four grades, and wood Sloyd the remaining four, there being a continuous line of application of this work in making physical apparatus for use in the school throughout the period. Whenever practicable, knitting, sewing, and cooking may be taught to the girls.

I think we have not seriously attempted to select a body of literature that should stimulate the mind to an interest in this correlation between man and nature, yet may we not do so? The main parts of *Robinson Crusoe*, already referred to, have for their chief content the industrial or economic problem. *Robinson's* constant thought is how he shall preserve his life and add to his comfort by mastering nature with the slender means at his command. As before indicated, the followers of Ziller are making great use of this narrative, but they diminish sympathy with their movement by insisting that the book is ethical in its chief function rather than economical, as it really is. The surest evidence of this fact is that most children are at once stimulated by their reading of *Robinson Crusoe* to dig caves, and construct boats, pottery, and the like, the ethical element remaining in the background unless forced

upon their notice. Children are quite capable of profiting by the story of *Robinson Crusoe* at the age of seven if it is narrated to them, but they cannot read it before the third or fourth grade. More advanced imaginative literature may be found in Jules Verne's books, *The Swiss Family Robinson*, More's *Utopia*, *The House that Jack Built*, *Lawrence's Adventures Among the Glass Blowers*, Rutledge's *Every Boy's Book*, and possibly for the highest class Bellamy's *Looking Backward*. Some of this literature may be incorporated with the regular reading work of the appropriate grades, but most of it should be placed in the school library.

Just as language is the formal side of the ethical core, and mathematics of the scientific, so mechanical drawing is the formal side of the economic core, and may be closely co-ordinated with it.

We have now three parallel-lying and somewhat independent cores of unification about which closely related subjects are grouped. The chief idea of the first, taken in a broad sense, is ethical, representing the deeds of man as a free being, the principle of sequence being the historical; the spirit of the second group is scientific, not ethical, and it represents nature in its independent aspects, the principles of sequence and correlation being determined chiefly by psychological grounds and outward circumstances, and only secondarily by the logical order of developed sciences; the third core of unification represents man and nature in interaction, and lays the chief emphasis upon preparing the child through industrial training the better to master and direct the forces of nature, providing at the same time a literary or imaginative contemplation of the economic field, and also a study of actual conditions in commercial geography.

Before considering geography as the universal study correlating all three branches in a very wonderful way, it may be well to mention some minor phases of correlation that cannot ultimately escape our notice. In the first place, I would point out the fact that nature has its literary side, and may serve at once as a basis for a part of the reading and also of

the language work, while drawing, as an æsthetic discipline, has manifold relations to nature and to the historical and literary phases of the curriculum. It thus becomes in a way a formal band joining the cores together. Music as another æsthetic branch is, so far as language content is concerned, closely associated with literature.

GEOGRAPHY THE UNIVERSAL STUDY AND BOND OF UNITY

Heretofore geography seems to have been taught mostly from the political standpoint; that is, it has been used to show the present resultant of all the historical forces; but our conception of the function of geography is at once broadened when we look to it for a partial answer as to how the facts of political geography have come to be as they are. In other words, while we study the processes of history we look to physical geography to show us the conditions and determining natural forces that have brought results to pass. This aspect of geographical science is forced upon us in a measure when we consider such events as Napoleon's disastrous Moscow campaign, but history as often taught is as unconnected with the earth as if all its events took place in the upper air. Since history must not only have a place in which to unfold, but the unfolding itself is largely dependent upon the physical features of the country—its mountains, rivers, seacoasts, forests, and climate, we have an explanation of the fact that geography, as the physical basis of history, is now becoming an important study in the curriculum. The elementary aspects of this relation should appear in the teaching of history and geography in the grammar schools.

Geography has also the most intimate connection with the biological sciences, since conditions of soil, climate, elevation, and contour, determine the character and extent of the flora of a country. At the same time they determine the food supply of animals, thus forming the main condition for their multiplication, distribution, and migration. In other words, whereas science studies plants and animals as individual things, we find in geography the chief external conditions of

this existence in its manifold variations. To no small extent, furthermore, do we find in geography a physical support for other phases of science study.

Finally, what is perhaps one of the most important fields of geography has been almost wholly neglected in the schools, viz., commercial geography. This shows in a remarkable way the interaction of the two factors, man and nature, and forms an important function in the economic education of the child. The foundations for this study are easily and fairly laid in the early home geography. While the child is out of doors gathering the elements of his geographical concepts, he may at the same time study the forms of industry at his doors, even if it be no more than the industry of the farm. A line of questions as to what is produced in the neighborhood and what becomes of the product, what is received in return for it, will open up a new world to the child. Then when he comes to study the productions of other lands and the geographical conditions that make them possible, following this up by an investigation of the means whereby the production of one land may be exchanged for those of another, he not only gets an enlarged conception of his own place and function in the world, but he learns practically the great ethical lesson that every part of the world, and every man in every part, is trying to serve self through service to others.

In the light of these considerations I think it may fairly be claimed that geography is the universal study, and that when liberally taught it forms the band that binds the ethical, the scientific, and the economic cores of instruction into a living whole.

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V

THE PEDAGOGICAL VALUE OF NUMBER FORMS—A STUDY

Several years ago the results of the investigations of Francis Galton on the subject of number forms were published, and attracted much attention. Mr. Galton estimated that about five per cent. of grown persons had the abiding mental peculiarity of seeing the numerals from 1 upward in some fixed form, which appeared instantly in the mind whenever it was needed. In response to his requests many diagrams were sent to him representing the various ways in which the numbers appeared to different individuals. Some were curved, some straight, some clear, and some shadowy, some in bright colors, others in dull gray or black. Most of those who had this power reported that the numbers appeared to them on a plane surface, but some described number forms which had three dimensions, and could only be represented by complicated arrangements of wire. Mr. Galton stated that his inquiries and reports were received with great enthusiasm by people from all parts of the kingdom who had individual number forms, and were gratified to find that others had the same mental peculiarity.

Psychological research was not so common then as now, and Mr. Galton remarked that persons of ordinary culture who did not possess number forms were apt to be very indifferent or contemptuous toward the subject. This made his investigations easier, as no time was lost peering into minds that yielded nothing. Those who had number forms found them indispensable to their mathematical calculations, and so firmly fixed in their minds by use were these forms that their possessors were generally able to give a clear report of them.

These investigations were of great interest to me, for ever since my remembrance began I have had in my mind the

following definite and unvarying arrangement of the numbers from 1 to 100.

								19
							18	
						17		
					16			
				15				
			14					
		13						
12								
11								100
10		29	39	49	59	69	79	89	99
9		28	38	48	58	68	78	88	98
8		27	37	47	57	67	77	87	97
7		26	36	46	56	66	76	86	96
6		25	35	45	55	65	75	85	95
5		24	34	44	54	64	74	84	94
4		23	33	43	53	63	73	83	93
3		22	32	42	52	62	72	82	92
2		21	31	41	51	61	71	81	91
1		20	30	40	50	60	70	80	90

I cannot tell when this form first appeared in my mind, nor why it took its particular shape. I remember reciting the multiplication table by traveling mentally over this form. In reciting the table of 6's, for instance, the numbers 6, 12, 18, etc,, would stand out distinctly from the others as I came to them. In adding, as 13 to 45, the number form appears with the 45 as a bold, central figure, and the mind instantly darts from the 45 toward the right and a little above, where the 58 is standing. When necessary the mind makes two motions, as in adding 27 to 45, one straight across to 65, and then downward to the right where the 72 stands. Subtraction is performed by reversing the motions.

An objection has been made to this process that it is long and tedious. But it is only tedious in the description. The process is instantaneous; the form flashes into the mind like a very familiar picture. It seems evident that the ideas of

direction and distance that belong to a number form must be of assistance in perceiving the relations of numbers, just as the ideas of direction and distance connected with the diagrams used in geometry are an assistance in perceiving space relations.

It will be observed that the number form given above is irregular up to 20. This irregularity is a positive disadvantage. For example, it has always required more mental effort to add 7 to 8 or 18 than to add it to 68, for the former had to be reckoned or remembered, while the latter appeared at once in its proper place in the number form, just as a certain figure appears on the typewriter when we look in the right direction for it.

Investigations among the few people whom I have met who had number forms, and hence were responsive to questions about them, show that the forms, however complicated and irregular they may be, are always a great assistance in arithmetical calculations.

Being asked if they can work more quickly and accurately with than without their number forms, they invariably reply, in substance: "I don't know. I have no idea how I should work without them, for I always use them." One lady whose number form was very extensive, told me that she could think of millions as easily as of tens. When she drew a part of the form the reason was plain. Each one of the numbers to 1000 had a set of ten numbers branching off from it, and the branching sets were branched again. It all looked very complicated and cumbersome, but she assured me that it made her concept of a million very clear.

Being a teacher, and hence inclined to look at new subjects for their teaching value, it occurred to me on reading Mr. Galton's writings that it might be possible, by presenting a regular scheme of numbers to little children, to give to them, or at least to many of them, a number form which should facilitate their arithmetical operations all through life. I was encouraged in this idea by observations made upon my own mind and those of others. Many persons had told me that

they always saw the alphabet in a vertical line from A downward to Z, *just as it was printed in the spelling book which they used in childhood.* I always see the alphabet in the following order:

A B C D E F G H I J K L M N O P Q R S T U V W X Y Z,

just as it was written on the blackboard of a certain primary school which I attended.

Every psychologist recognizes the value of local memory in learning tables or lists. No skillful teacher would have his pupils recite the declension of Latin nouns in varying order, beginning one day with the genitive and another day with the ablative. He knows that the unvarying order from nominative to ablative which is in general use helps to keep the form in the memory, and that the concept of the paradigm is freshened by every repetition which the pupil happens to hear or see. The systems of outlining and diagraming, which at one time were supposed to be about to place all ascertained knowledge within the grasp of even weaklings, derive much of their value from this well-known principle of local memory. The methods of memorizing, which are the foundation of most of the "memory systems" that are advertised with a view to catching the half eagles of the unwary, are said also to depend upon this principle of local memory applied to mental picturing, and their worthlessness is said to be due to the fact that they place in juxtaposition representations of ideas which are in no way related. But the numerals follow one another in regular succession, so that it was judged that an attempt to give them a "local habitation" as well as name, would violate no law of the mind. It was reasoned also that numbers arranged and spaced in any convenient fashion would be more easily grasped and worked with than when unclassified.

Becoming interested in Dr. Stanley Hall's investigations into the minds of children, I was encouraged by them to work in that direction, and determined to make an attempt to

arouse number forms. Unfortunately my school, being a small private school, had very few little children in it.

In considering ways for giving children concepts of number connected with space it seemed necessary that these, in order to be retained, should be presented to children when they began to think number, and continuously for a long time. Of course it would be worse than useless to question a little child directly as to the existence of number forms in its mind. Children lack the power of introspection, and they have great imaginative power, and are in danger of unintentionally becoming mental hypocrites by furnishing the investigator any mental peculiarity he may be looking for as soon as they understand what is wanted. The better the child, that is, the more responsive to the teacher's will, the greater the risk. For this reason the investigator is likely to be misled when he attempts to discover the contents of children's minds by direct questioning, and must depend largely upon indications which are thrown out unexpectedly, and in many cases at long intervals.

One of my pupils showed great readiness in dealing with fractions when first introduced to the subject. The question "What is $\frac{3}{7}$ of 21?" being asked, she gave the correct answer instantly, while the rest of the class were getting ready to solve it. "How did you get it so quickly?" asked the teacher. "Why," said the girl, "there is 21, and the other two 3's that go on and look different." She could not make her meaning clear, and she was not urged. At another time being asked for $\frac{7}{8}$ of 100 she instantly gave $87\frac{1}{2}$. Being invited to explain her quick method for the class, she replied: "I cut $12\frac{1}{2}$ off from the right hand side of the 100," making an illustrative gesture with her right hand. Her work in arithmetic was always remarkably clear and accurate, but her explanations were usually more interesting to her teachers than beneficial to her schoolmates. It was evident that she was visualizing numbers in some way, but it was impossible to tell whether she had a permanent number form or was merely making a fleeting mental picture. She passed out of my observation

for a few years, during which our attempts to give the children of the school a basis for number forms were carried on. A short time ago, during one of her college vacations, I asked her directly if she had any particular way of seeing numbers mentally. She immediately gave me the following diagram:

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2
1

She illustrated her way of adding by saying that in adding 8 to 25 her mind first jumped from 25 to 35 and then down two spaces to 33. To the comment that it seemed wasteful to make two motions for so small a number as 8, she answered

that she was obliged to do so whenever the added number was so large that she had to jump to the next column. I suggested that probably that was due to the fact that her number form was inconvenient in not having the columns side by side, and asked her to arrange them so for a moment, and then add. She said that it confused her, and we laughingly agreed that a Society for the Prevention of Inconvenient Number Forms would soon be in order. Being questioned as to what she meant by "jumping," she said that the numbers appeared upon a flat surface, and that the motion of her mind seemed to be in a curve, rising from the number which she started with, and pouncing down upon the right number where she stopped. I knew nothing of that, as I pass from one number to another in my mental diagram, in the same way in which I turn from the paper on which I am writing to the figures on the clock face, with no cognizance of intervening space nor of motion across it.

The attempt to promote directly the growth of number forms in the minds of children was begun in my school six years ago. The object to be attained being thoroughly understood by the young lady who had charge of the primary children, a conscientious and enthusiastic teacher, we arranged our plans. Not knowing of any similar work we were obliged to think out each step, and to change our plans and bring in new devices as they seemed to be needed.

The decimal notation and the common habit of numbering downward suggested the following form:

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	20	30	40	50	60	70	80	90	100

All the little children who came into the school were given as a part of their manual work the copying of this table of numbers. The aim kept before them was to make the work neat, regular, and with beautiful figures. It was copied on paper, on the slate, and on the blackboard. The best work was left on the board until some other child succeeded in making a prettier table. An especially good paper copy was pasted in a scrapbook along with fine penmanship, maps, and drawings, and the child was brought to the favorable notice of the principal. The children were encouraged to decorate their number tables in various ways, but were not allowed to change the arrangement of the figures nor to suppose that they could be changed. If we gained nothing else we got neat work and an interest in it. The regular work in number went on at another time of day, with no connection whatever with this table of figures. The objective method of building numbers was used in the regular work, and any reference to the number table was carefully avoided until the children had learned the numbers up to 10.

By that time the number table was an old story, and though one was always kept in sight in order that it might be unconsciously absorbed by the minds of the pupils, little work was done with it except when a new pupil came in. After the number 10 was mastered the children were set to the formal learning of the multiplication table beginning at the 10's. They wrote the number table, making the multiples of 10 in bolder figures as below, or with colored crayons.

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	15	25	35	45	55	65	75	85	95
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**

They were taught to count by 10's, stopping at 100, to notice and state facts about 10, and to recite the multiplication table of 10's. They were led to consider the 10 as a whole. Four 10's were as concrete to them as four upright sticks, with the added advantage that 40, the sum of the four 10's, was staring at them from the lower right-hand corner of the included space. The children soon learned to return the stare. They were drilled in adding, as 10 to 4, to 14, to 24. They pointed out the results on the table, just as they afterward pointed out places on the map. They subtracted by spacing back to the left, and performed easy divisions or partitions, such as ½ of 60, ¼ of 40. As soon as they were able they were exercised without referring to the board. When they failed they were told to "think how it looked," and if they still hesitated they were told to look at the table on the board. They were led to locate numbers by such questions as "What is the last number of the seventh 10?" "What is the third number of the fifth 10?" After they had worked on the 10's until each child had learned the combinations, and had used all the desirable colors of crayons, still trying to make "pretty work," the 5's were taken up.

1	11	21	31	41	51	61	71	81	91
2	12	22	32	42	52	62	72	82	92
3	13	23	33	43	53	63	73	83	93
4	14	24	34	44	54	64	74	84	94
5	**15**	**25**	**35**	**45**	**55**	**65**	**75**	**85**	**95**
6	16	26	36	46	56	66	76	86	96
7	17	27	37	47	57	67	77	87	97
8	18	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	99
10	**20**	**30**	**40**	**50**	**60**	**70**	**80**	**90**	**100**

The reason of this choice is obvious, as the 5's are simply divisions of the 10's. The children took up the 5's in the same way, counting by 5's, reciting the table, adding and subtracting by 5, making simple partitions, answering such questions, as "Point out the seventh 5"; "What is its middle number?"

The tables of 10's and of 5's are well adapted to division into regular geometrical forms, and we made the most of them. In taking the next step it was considered that as the 9's stood next to the 10's, and made fewer divisions of the numeral form than the smaller numbers, that table should be selected. The result was so satisfactory that we have never varied from that order. Below is the table of 9's as it was presented:

1	11	21	31	41	51	61	71	**81**	91
2	12	22	32	42	52	62	**72**	82	92
3	13	23	33	43	53	**63**	73	83	93
4	14	24	34	44	**54**	64	74	84	94
5	15	25	35	**45**	55	65	75	85	95
6	16	26	**36**	46	56	66	76	86	96
7	17	**27**	37	47	57	67	77	87	97
8	**18**	28	38	48	58	68	78	88	98
9	19	29	39	49	59	69	79	89	**99**
10	20	30	40	50	60	70	80	**90**	100

One little fellow exclaimed on first seeing that table: "How easy that is! It just runs right uphill." One advantage of our very small classes (there were rarely more than three in the little folks' class) is the freedom of speech and action that may be allowed. We heard from the children many interesting and instructive comments, which almost compensated us for the misfortune of having so few children to work with. Another child discovered that the table of 9's gave a number constantly decreasing by one in the unit's place, and was very much surprised and a little disappointed to find that that fact had been found out before. Another expressed contempt for an older child in another school who didn't know the 9's, saying: "Anybody who knows enough to go upstairs ought to know the 9's, because they just go up by steps all the way." The idea of steps is generally popular, and more than one child has told her teacher that she "liked the short flight the best" meaning 90 and 99. Although the 9's look so easy, it takes some time to learn them, and the children often have to refer to their number tables. As besides teaching the

multiplication table we have the secondary aim of giving the children permanent impressions of the number tables to be recalled at will, or to come as true number forms do—involuntarily—we allow them to refer to the table very freely, our observation leading us to believe that a child will not even turn his head to get a form which he can get without turning it by looking into his own mind. If the form is not in his mind we would rather take a good deal of trouble to give it to him than to have him choose the wrong form, for every time that he entertains a wrong idea he blurs the impression of the right one already made.

The same considerations that led us to select the 9's induce us to take the 8's as the next table:

1	11	21	31	41	51	61	71	81	91
2	12	22	**32**	42	52	62	**72**	82	92
3	13	23	33	43	53	63	73	83	93
4	14	**24**	34	44	54	**64**	74	84	94
5	15	25	35	45	55	65	75	85	95
6	**16**	26	36	46	**56**	66	76	86	**96**
7	17	27	37	47	57	67	77	87	97
8	18	28	38	**48**	58	68	78	**88**	98
9	19	29	39	49	59	69	79	89	99
10	20	30	**40**	50	60	70	**80**	90	100

The stairs are steeper now, and there is more to review, and the work goes more slowly. After taking the 8's we have tried two different plans. In one case we went on with the 7's, 6's, 4's, 3's, and 2's. In the other we considered that the 4 was a convenient part of 8, and used the table of 4's directly after the 8's, and for the same reason the 2's immediately after the 4's, then going back to the 7's and taking the omitted tables. As we always keep up the review I do not know that either plan makes any difference in the ease with which the children learn the tables. They take the 2's and 3's very easily in either case, for they have become expert in counting. We have usually followed the second plan, because by it we sooner reached the small numbers, and our work was in this way connected with the regular work about the apples.

and the triangles and all the objects pictured in the primary arithmetic.

1	**11**	21	31	41	51	61	71	81	91
2	12	**22**	32	42	52	62	72	82	92
3	13	23	**33**	43	53	63	73	83	93
4	14	24	34	**44**	54	64	74	84	94
5	15	25	35	45	**55**	65	75	85	95
6	16	26	36	46	56	**66**	76	86	96
7	17	27	37	47	57	67	**77**	87	97
8	18	28	38	48	58	68	78	**88**	98
9	19	29	39	49	59	69	79	89	**99**
10	20	30	40	50	60	70	80	90	100

The 11's offer so pleasant a slope that they can be presented at any time after the 9's. We usually gave them as a relief from the sharp climbing of the 7's or 6's, if the children had not in the meantime presented them to us.

Of course we never set a child to learning a table from his book. We want them to think number, and we should feel very guilty if we put children on such a mental scamper as is involved in trying to think number while repeating "Seven 2's are 14, seven 3's are 21," etc.

Limits of space forbid the mention of all the devices by which we have tried to fix the forms in the minds of the children, but I have written enough to give an idea of our attempt to anyone who may be impressed, as I have been, with the pedagogical possibilities of number forms.

I am aware that it is contended by many that children should be taught number only in the concrete, and that there is much disapproval of what is called figure manipulation. It is true that poor work is done in arithmetic by allowing children to manipulate figures, the signs of number, before they have learned to think number. But the method of representing number by objects, as toothpicks or pebbles, is only applicable to small numbers, and is entirely inadequate to the demands of the multiplication table. In our attempts to arouse number forms we go consciously into figures, trusting to the growing minds of the children to make the connec-

tion between figures and numbers at the proper time, just as every mind does that masters arithmetic.

Whether they have permanent number forms or not we cannot yet tell, but they certainly had them while they were learning the multiplication table, and probably they needed them more then than at any other time of life. We discovered that we were robbing the multiplication table of most of its terrors. To those children the multiplication tables were not a succession of statements of unrelated and memory-slipping facts, but a record of their own personal observations on the relations of numbers.

A girl from the sixth grade once entered the school who was very deficient in arithmetic. Watching her multiply wrongly one day, I leaned over her shoulder and said, "Seven 9's are 63." She looked up quickly into my face for possible sarcasm, but finding none went on with her work. Her seat was near my desk, for I had placed her there for the double purpose of studying her and of directly influencing her, as I had heard that she was dull and disagreeable. The next day she quietly asked me for the product of two numbers. She kept that up for several days, arousing much interest in the rest of the class, some of whom seemed to think that they had lost time and ease by not hitting on the plan which worked so well for the new scholar. When it became evident that she really did not know her multiplication table I had her put on cards the tables of 6, 7, 8, and 9, in bold figures, like those above, with the suggestion that when the class were working for speed and accuracy those tables might help her.

I confess that I gave them to her on the same principle on which physicians sometimes prescribe—they could do no harm and might do good.

She used the cards constantly at first, but after a while they disappeared. One day she came and thanked me again, saying that the cards had been a great help to her, but that she did not need them any more. Her work was then about like the average, and so continued. This incident confirmed me in my belief that the only dangers to be avoided in trying to

excite number forms in the minds of children are those of wasting time and boring the children.

It has been wisely said: "A child's mind is not a fountain to be reached by boring." Mindful of that we made it a rule to stop active work at the symptoms of weariness, trusting largely to the unconscious absorption of the forms which were constantly before the pupil during the earliest years of school life. If, as Galton says, five per cent. of adults have constructed for themselves a form more or less convenient with which they perform arithmetical operations, it would seem to be not a difficult matter to give to a still greater proportion of children a convenient and helpful form by persistent presentation at the impressionable age at which they learn number. The opportunities offered during the learning of the multiplication table are ample for that. The fact that so many persons have these forms indicates that many minds crave some such scaffolding for their concept of number.

I have always desired to make these experiments in a graded school of ordinary size, where the results could be watched from year to year, and I hope other students of the child mind will make and report experiments in this direction.

As an indication of the tenacity with which the mind clings to its own number form, I may say that with all my thought and work upon the form given to the children I never use it in my own calculations, seeing numbers and reckoning with them by means of the inverted and imperfect number form which I have had since I can remember.

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VI

EDUCATION IN FOREIGN PERIODICALS

The Teaching of Greek

JOHN STUART BLACKIE IN "THE JOURNAL OF EDUCATION" (LONDON)

"When the literary, social, and political influences that combine to give a formative power to the dialect of the upper classes cease to act, then the popular dialect will usurp the vacated throne, and partly out of its own wealth, partly by various adoptions from foreign sources, create what practically amounts to a new language. This is exactly the relation in which Italian and Spanish stand to the classical Latin of the Roman Empire.

"But with Greek it is different; in Greece under the Byzantine Empire no new language could be formed, and for obvious reasons; the eastern or Greek half of the Roman Empire lasted for fully a thousand years after the fall of the western half; and so long as it lasted the natural dominance of hereditary Greek in the educated classes of the political, social, literary, and ecclesiastical sphere could not be disturbed. And when, in the declining centuries of the Greek Empire, first Italian and then Turkish influences began to operate in corrupting the purity of the language, the hostility between the popular Greek feeling against the Latin Church on the one hand, and the Mahometan despotism on the other, was so great that any new formation, such as that which has created modern English out of Teutonic and French elements, and Italian out of provincial corruptions, was impossible. So much so that if, after the taking of Constantinople by the Turks in 1543, even a Dante had stood up to stamp his genius on the most corrupt of local Hellenic forms, he would have failed, in the face of the transmitted culture of centuries, to create a new language for the general Greek people. The linguistic result from the operation of these causes is quite plain. The language called Modern Greek, and used in the Greek newspapers, which have a large circulation, is in no proper sense a new language. As little can the Greek of Plato and

Aristotle, and the other classics commonly read by scholars, with any propriety be called a dead language; the language of Homer bears the same relation to the language of Bikelas and Tricoupis that the language of Chaucer does to the written English language of the present day; there is no break in the living continuity of the linguistic stream, and the slight shades of difference between the Greek language as we know it in its oldest form, and as it is now spoken by every educated gentleman in Greece, are of no more significance than the lopping of a few straggling branches from a stout old tree, or tearing a strip of superfluous lace from a dress gown.

"This being my decided opinion on a subject in regard to which great ignorance and strong prejudice in high places are prevalent, no one need be surprised at the practical conclusions to which such premises necessarily lead. Greek is a living language, and has all the rights that belong to a language transmitted through long centuries to the action of living forces in the present. One of those rights is that it should be taught as French or German is, by living communion with the people who speak it, and that, of all absurd practices belonging to the stiff conservatism of English pedagogues, the most unscientific, at once, and most unpractical, is the practice of studying a living tongue from dead books merely, and dead grammar rules, and, so far as the ear is allowed to play its part in the business, to pronounce the most beautiful language in the world with the insular orthoepy and the unmusical accentuation of the English tongue. Taught in the legitimate way, by living converse with living Greeks, on the spot, if possible, where Socrates discoursed and Paul preached, I have no hesitation in saying that more effective Greek may be learned in five months than is now acquired in five years of painful bookish cram and barren grammatical formalism."

The Teaching of Mathematics

FROM AN ADDRESS BY W. H. H. HUDSON, REPORTED IN THE "EDUCATIONAL TIMES" (LONDON)

"The earliest teaching of arithmetic begins slightly before a child can speak, and is usually carried on far too rapidly as soon as he obtains the use of his tongue. The earliest teaching of solid geometry should begin as soon as a child can play

with a box of bricks; of plane geometry a few years later, when he can wield a pair of compasses. This teaching is often deferred too late. The earliest teaching of algebra occurs some years later still, when considerable facility is acquired in the use of the pen, or at least pencil, and when the child, if a boy, has probably come under masculine influence.

"Now all teaching, as Aristotle points out, is based on previous knowledge.[1] Our teaching of mathematics is based on this early teaching which we do not give. It is a strong argument for the improvement of the education of women of all classes, that the early education of all children is almost entirely in their hands; the importance of this early education can scarcely be overrated.

"All mathematical teaching should be conducted so as to accord with the fundamental laws of pedagogy; of these the one which is the first in importance is this: *the understanding of the pupil is to be employed throughout.* This is a general canon of all teaching; it is especially needful to be observed in mathematics. Progress in mathematics is peculiarly hampered by the substitution of memory and imitation for understanding. The multiplication table is often learned by heart, parrot-like, and sung as a song, instead of being formed gradually by the child. Definitions and propositions of Euclid are learned *verbatim* in like manner. Formulæ are allowed to be used without being understood. Methods of doing sums are justified solely by the consideration that the answer comes right. 'Shut your eyes, and write down your equations,' is the advice said to have been given by a coach. All this is wrong; it is contrary to the first law of teaching; it is calculated to stunt instead of to develop the mental powers. Principles, maxims, theorems, formulæ, definitions, should never be given to a learner without his intelligent comprehension of them, under the notion that they thereby obtain a firm place in his memory.[2]

"The amount and the duration of the mental exertion necessary for the study of the beginnings of mathematics, admit of being graduated to suit the power of the pupil, however young. To count the number of chairs in a room is an exercise suitable for an infant, and would occupy a minute. A boy may have three or four sums to do which will occupy

[1] *Ethics*, Book VI., ch. iii.

[2] In opposition to Bain, *Education as a Science*, p. 206.

him a quarter of an hour. The beginnings of mathematics are entirely mental; no sitting at a table, crouched in an awkward attitude, is needful for an arithmetic or geometry lesson in the kindergarten.

"The active exercise of the mind is fatiguing; therefore, lessons should be, for the young, short, and because short, frequent. The pain of fatigue is soon overbalanced by the joy of success; moreover, the pain diminishes as the mental powers increase; nay, even it is turned into a pleasure—a pleasure in the quest as well as in the attainment—'*labor ipse voluptas.*'

"In no subject better than in geometry can the joy of the discoverer be obtained. It is possible to propose to the veriest beginner problems suited to his nascent powers, yet requiring their exercise; while the finger-work necessary for the careful construction of the diagrams, which should be insisted on, affords a relief from the mental effort of discovery. This educating power of geometry is lost by those who set propositions to be learned by heart.

"Some of the propositions of the first book of Euclid will seem to be quite unnecessary to a child who has had a preliminary training in the actual use of the ruler and compasses. Here a fresh difficulty will arise—a difficulty welcomed by the teacher as the opportunity for instruction in the nature of proof; fallacies may be propounded and exposed, and so, early ideas of logic may be instilled, but without the uncouth technical terminology of the logician.

"What are called 'riders,' should be used from the very outset; nay, even the propositions themselves should be primarily regarded as riders, the text being consulted only after a real effort, successful or unsuccessful, has been made to do without it. To facilitate this beneficial exercise, I submit that it may be pardonable to tell the beginner, as facts to be hereafter proved, some properties, such as that the three angles of a triangle are equal to two right angles, or that the angles in the same segment of a circle are equal, for the sake of proposing to him some simple deductions from these theorems.

"In order to assist to develop this necessary exercise of the pupil's understanding, it is a good maxim that the teacher should not do for the pupil what the pupil can do for himself. Self-reliance should be cultivated. But the learner is not to be quite in the position of the first discoverer. The use of

the teacher is to guide, to direct, to warn against dangers, to give a helping hand in different places, and so to facilitate progress, but the pupil must make that progress himself. The guide chooses the path and prevents the wrong road being taken; he may help over rocks, but the traveler must walk along the meadow unassisted. A mistake may be pointed out and wherein it consists; the correction should generally come from the pupil.

"The teacher should not set, and should restrain the pupil from proposing to himself, exercises that are beyond either his strength or his knowledge. To strain the mental powers is not to develop them. Here much judgment is required in the teacher. In many cases it is not power or knowledge that is deficient in the pupil, but strength of will.

"Secondly. There is a certain way in which the human mind naturally acts, and this cannot be departed from without injury. There are those who contend that the order in which an individual learns should be that in which the race as a whole has acquired knowledge. Whether this is true in all cases we may be permitted to doubt. But as much as this is certainly true, that the earliest knowledge of the child, like that of primitive man, is derived from the senses. And it is equally true, whatever some philosophers may say to the contrary, that the primary notions of mathematics are acquired through the senses. It is simply impossible to acquire them otherwise. There is, therefore, a certain Law of Sequence, which requires that what is called the abstract idea or notion, should be based upon and formed out of sensible perceptions. It is usually quoted, 'The concrete must precede the abstract.' It is, moreover, a breach of this Law of Sequence to stop short at the sensible perception and not to pass on to the generalization.

"In order to comply with this law we should begin to teach arithmetic with actual things to count. Counting is sometimes made to consist of a rehearsal of the names of numbers. This is a mistake, from the consequences of which some people recover with difficulty. Visible illustrations of the properties of fractions should be used. Actual weights and measures should be seen and handled. We should begin to teach geometry by tangible models of cubes, spheres, cylinders, cones; the pupil should actually rule lines with a ruler, and draw circles with compasses.

"But we should not continue the use of these visible and tangible helps after they have served their purpose. The notions or ideas should be formed so strongly that the mind's eye sees them when the things are not present in later reasonings about them. In fact, the things themselves—the line without breadth, the perfect circle—from their nature cannot be present; the best we can obtain is only an approximation, valuable as an illustration and as a means of acquiring ideas, but no more. Even a badly drawn circle will serve a person who knows what a circle is, but he cannot acquire the idea of a circle from badly drawn circles. He who can draw a good figure need not, he who cannot draw a good figure must. The badly drawn circle does not give a wrong impression to the mind which is full of the true idea of a circle, the mental conception being stronger than the visual image; whereas a badly drawn circle retards the acquirement of the conception of a circle by one who has never acquired it.

"We must be careful also not to carry this requirement of sensible objects too far. It is not necessary to make visible or tangible models of all figures; one who has a knowledge of a triangle, a square, a pentagon, a hexagon, may form a sufficiently accurate idea of a heptagon or a decagon without drawing it, still less is it needful to draw a figure of twenty or thirty sides in order to form a mental conception of it. It is a valuable mental exercise to form such images, but they are formed out of elements primarily acquired through the senses. We build castles in the air out of the images of the battlements and turrets of real castles; but no one can combine ideas that he has not got.

"Progress in mathematics consists in the combination of comparatively few fundamental conceptions. To substitute words for these conceptions is to prevent the possibility of progress. Words, however, have a very real part to play in our teaching, for it is also a part of the Law of Sequence that when a general idea has been formed, then, and then first, should a name be given to it: this is quoted as 'the thing before the name,' thing meaning an object of thought, not necessarily a material thing, and in algebra the name may be a sign.

"I fear we often offend against this law. Do not some of our pupils gabble through the first book of Euclid without really knowing the meaning of 'bisect,' because they have never made an effort to bisect anything, or the third book

without knowing the meaning of 'touch,' although the verbal definition of this term has been committed to memory? Such boys, who have merely learned by rote phrases meaningless to them, not only fail to derive advantage from the study of geometry, but by becoming habituated to the use of words without meanings have weakened their mental power, while they have lost the natural curiosity of childhood which should have been utilized to impel them to intellectual effort; thus

> Shades of the prison house begin to close
> Upon the growing boy [3]

too soon, before their time.

"The neglect of natural sequence of mental activity, namely, first the appreciation of the sensible object, then the mental visualization, finally the abstract generalization to which a name is given, may well be thought of as the great cause of stupidity. As the power of the mind grows by its natural use, so it diminishes if disused or abused. 'Whosoever hath not, from him shall be taken away even that he hath.' [4] 'We never saw,' says a well-known author, 'a stupid infant.' [5] It may be that the stupidity of boys is due to our neglect of this canon of teaching.

"The next general law of teaching that we must observe is that of *continuity*. That which is new and unknown should be made to grow out of that which is old and known. Evolution is true in the mental as in the physical world. The particular case prepares the way for the general, the easy for the difficult; the difficulties, even the impossibilities, are the avenues leading to new knowledge; thus, vulgar fractions arise out of division, the negative quantity grows out of a seemingly impossible subtraction, logarithms arise out of the general index, the arithmetic of square measure is derived from the geometry of the rectangle.

"The subdivision of mathematics into separate subjects tends to obscure the connection between them. We should be watchful to seize opportunities of bringing out, whenever possible, the connection of algebra and arithmetic, and of both with geometry. Even the illustrations that we choose to explain a particular point are all the better, sometimes, if they are seen to be connected with the next.

[3] Wordsworth, *Ode on Intimations of Immortality*, v.

[4] Matt. xiii. 12.

[5] De Morgan, *On Teaching Arithmetic*, Q. J. Ed., ix.

"In order to preserve this continuity, it is essential that the old, the known, must be soundly known and firmly grasped. The pupil should have to unlearn nothing as he advances. The earlier teaching should be designed so that the later can be easily joined on to it. On this account it is desirable that the teacher should have a grasp of subjects beyond what he is actually teaching, that he may prepare the way for the future. It is a mistake to ask an ignorant teacher to take an elementary class.

"Thus the teacher of arithmetic should be watchful to assist the transition to algebra, and the teacher of algebra should frequently bear in mind the subsequent study of the Differential Calculus.

"In arithmetic, subtraction should be taught as a shopman gives change, because this smooths the way for the improved long division. The highest digit of the multiplier should be used first in the multiplication of whole numbers, because this facilitates the approximate multiplication of decimal fractions. Arithmetic may be taught so as to prepare the student to pay regard to dimensions in mechanics, and in the treatment of circulating decimals either sound ideas may be given facilitating the acquirement of the important doctrine of limits, or confused ideas may be allowed to be formed retarding the pupil's progress and throwing additional difficulties in his way. It were better not to touch this part of the subject at all than to do this; in fact, in accordance with the first law of teaching, if the subject is beyond the pupil's comprehension the teaching of it should be deferred. The particular instance quoted, however, is quite intelligible at a much younger age than is often supposed.

"Mathematics are sometimes thought to require operations of the mind different from those employed in other studies.[6] It is not to encourage the art of observation. As we all know, this is not the case. The teacher should take opportunities of exercising this faculty, and should ask his pupils to notice distinctions, and when they have discussed them by clumsy periphrasis, when the *thing* has thus become known, the *name* 'binomial,' 'homogeneous,' or whatever it is, may be given; there are many opportunities for lessons in classification based on observed distinctions.

"Another common mistake is to suppose that mathematics do not admit of reasoning from analogy; on the contrary, the

[6] "Of observation, experiment, induction, analogy, the mathematician knows nothing."—Sir W. HAMILTON.

good teacher bases his pupils' apprehension of mathematical method upon the analogy which he guides them to observe in the mode of solution of similar problems.

"Inductive reasoning is also said not to appear in mathematics. On the contrary, the mathematical teacher will often lead his pupils by particular examples to guess by induction a general formula, and then he will be able to show them how to verify their guess, and ascertain whether their induction is justified. They will sometimes guess wrong, and thereby learn to distrust an unverified induction.

"The use of experiment to ascertain whether a proposed theorem is likely to be true, is another instance of the application of a mode of investigation often thought to be foreign to mathematics.

"Another subject most intimately connected with mathematics is language. One of the aspects of algebra and the differential calculus is distinctly linguistic. It is a valuable exercise for the pupil to translate his symbols into the English language. Clear and exact language is requisite in order to state mathematical problems, and the necessity of using it constitutes one of the difficulties of the learner, but it is a difficulty in the overcoming of which mathematics give much of the intellectual benefit which is supposed only to be derived from the study of a foreign language. The power of stating a physical problem in the language of the differential calculus is an acquisition worth having, even if the subsequent solution of the problem is at present impossible.

"The greatest difficulty of all is in the want of desire to learn; this has been alluded to. When it takes the extreme form of the hatred of knowledge[1] for its own sake, it is simply insuperable. Why people should not want to learn mathematics is a question that would carry us too far from our subject, which is how to teach and to avoid mistakes in teaching those who do want to learn. A main difficulty arises from that chain-like connection of the parts of mathematics which, properly employed, facilitates the learning of it. A weak link in the mathematical chain breaks under the stress that the attempt to make further progress imposes upon it. A student, for instance, who has been allowed to use the sign — without understanding it, who has been contented with a mere 'rule of signs,' can never be trusted, can never trust himself,

[1] Proverbs i. 22, 29.

not to trip in the use of it. Consequently, he cannot follow a blackboard demonstration, cannot simplify expressions correctly, is perpetually hampered by what he thinks are trifling mistakes, mistakes primarily due to a want of proper attention to signs when he was first introduced to them, and his infirmity is now rendered difficult to correct on account of that very familiarity with the signs which, in accordance with the proverb, prevents their receiving respectful consideration.

"One who has never understood thoroughly the relations of length, area, and volume, experiences exceptional difficulties when the more complicated notions of mechanics are presented, involving the further conceptions of time and mass. It is a cruel thing to teach a person arithmetic without giving him the advantage of a rational study of square and cubic measure, or to limit his geometrical teaching so as to exclude the discussion of similar figures.[8] A valuable training is missed, and the want of this knowledge seriously impedes, nay, even sometimes entirely prevents, further progress. All that has been said of the usefulness of so teaching the early subjects as to prepare the way for the later may be repeated as causes of difficulty in teaching the later subjects when the way has not been so prepared, and of still greater difficulty if the earlier subjects have been so taught as to obstruct the acquisition of later ideas.

"A practical difficulty is sometimes the infrequency and length of the lessons; what is wanted for young beginners in mathematics—I suspect that it would be best for all subjects—is frequent short lessons. Some pupils, say for geometry, have two hours a week; now, if this were in four lessons of half an hour each, or even six lessons of twenty minutes each, progress would be rapid and the time ample; but when it is in two lessons of one hour each, much of the time is necessarily wasted on account of the incapacity of the pupils or prolonged mental exertion. There should be short lessons with full attention.

"Another difficulty of mathematical teaching arises from too great dependence on text-books. The order in which a writer groups the various parts of the subject is not always that in which the learner can most easily assimilate and digest the matter. Oral teaching overcomes this difficulty, which is one of the more advanced rather than of the elementary teaching, for the schoolboy rarely reads a text-book."

[8] London University Matriculation, used as a leaving examination.

VII

DISCUSSIONS

THE NEW JERSEY PAROCHIAL FREE SCHOOL BILL

So many inquiries have been made concerning the nature and provisions of the bill recently introduced in the New Jersey legislature to enable parochial schools to participate in the distribution of the state school funds that the full text of the proposed legislation is given below:

A SUPPLEMENT to "An Act to establish a system of public instruction," approved March the twenty-seventh, eighteen hundred and seventy-four.

1. BE IT ENACTED *by the Senate and General Assembly of the State of New Jersey*, That in order to increase the public school accommodations and to carry out more fully the provisions of the constitution of this state, wherein the legislature is empowered and commanded to provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all the children in this state betwen the ages of five and fifteen years, that whenever any private school corporation incorporated under the laws of this state, having an average yearly attendance of forty-five or more pupils within the school age, shall file in the office of the state superintendent of public instruction and in the office of the county superintendent of schools in which said private school corporation is located a certified copy of incorporation, together with an agreement signed by the officers of said corporation to maintain their said school a free public school, according to law, it shall be lawful for, and the duty of the county superintendent of public instruction of the county from which application is made, to appoint, within a reasonable time, the president, secretary and treasurer of the said corporation, a board of school trustees, of which the secretary shall act as clerk, and discharge the duties of district clerk now required by law.

2. *And be it enacted*, That said board of school trustees shall be vested with all the powers and privileges, and subject to all the conditions, requirements, duties and penalties contained in an act entitled "An Act to establish a system of public instruction," approved March the twenty-seventh, one thousand eight hundred and seventy-four, with the supplements thereto, and the acts amendatory thereof, excepting such parts of said act, referring to district public schools, as are not applicable to said additional free public schools herein provided for.

3. *And be it enacted*, That no person shall be employed as a teacher by such board of trustees unless he or she holds a regular teacher's certificate in full force and effect, according to law, at the time the engagement is made, and any contract entered into between any teacher and said board of trustees shall not be valid unless the teacher has fully complied with the law.

4. *And be it enacted*, That it shall be the duty of said board of trustees, through the clerk of said board, to make all the school reports within the time now required by law, and to make the additional report, duly verified to the

state superintendent and county superintendent aforesaid, on or before the first day of April of each and every year hereafter, the name, age, name of parents or guardians of all the pupils, residing within the city or school district in which said additional free public school is located, taught in said school or schools, during the school year, together with the average yearly attendance.

5. *And be it enacted*, That it shall be the duty of the board of trustees to maintain and furnish for the use of said additional free public school, all suitable school buildings with the necessary appliances, as now required by law, at the expense of said corporation, and free from all cost or expense to the state therefor, and to maintain said schools free from all sectarian instruction, during the school hours or school sessions.

6. *And be it enacted*, That said additional free public school so established, whether in city, town, or rural district, shall be under the superintendency and inspection of the county superintendent of the county in which said school or schools are located.

7. *And be it enacted*, That the county superintendent of the county in which said additional free public schools are located, shall include the said additional free public schools in making his annual apportionment of public school moneys for the free public schools of the county.

8. *And be it enacted*, That it shall be lawful for and the duty of the county superintendent aforesaid, in making the yearly apportionment of school moneys, to assign to the said additional free public schools, from the state school money due any city or school district, the same amount per child, residing in city or district and attending said additional free public school, that it cost the state, in the preceding year, for each child taught within the school age, determined by the yearly average attendance in the state.

9. *And be it enacted*, That the county collector, in and for each county, shall be and is hereby authorized to deduct from the state school moneys due any city, town or school district in which said additional free public schools are located, the proportion of state school moneys to which said additional free public schools are entitled.

10. *And be it enacted*, That the county collector in each county shall be the custodian of, and shall hold in trust, all such moneys as are apportioned to said additional free public schools, and he shall pay them out only on the order of the county superintendent.

11. *And be it enacted*, That the county superintendent shall, upon the warrant of the board of trustees of said additional free public schools, duly signed by the clerk and at least one other member of the board, draw a school order or orders upon the county collector, in favor of the teacher or teachers in said additional free public school and for the payment of such incidental expenses as the law allows for public schools.

12. *And be it enacted*, That all such school orders shall be indorsed by the person or persons entitled to receive said money, and that the purposes for which payment is demanded shall be stated in each order.

13. *And be it enacted*, That it shall be the duty of the county superintendent to withhold the aforesaid school order or orders on county collector whenever the provisions of this act and the act to which this is a supplement are not fully complied with in good faith.

14. *And be it enacted*, That all acts and parts of acts, general, special or local, as far as they are inconsistent with this act, be and the same are hereby repealed.

15. *And be it enacted*, That this is a public act, and shall take effect immediately.

The foregoing bill was introduced March 6, 1893, by Mr. Coyle of Hoboken (by request) and was referred, under the rules, to the Committee on Municipal Corporations, by whom it was favorably reported two days later. Before a vote was taken, however, a resolution was introduced and passed to obtain the opinion of the Attorney General as to the constitutionality of the proposed law. Below is the full text of the Attorney General's opinion:

ATTORNEY GENERAL'S OFFICE,
TRENTON, March 8, 1893.

HON. THOMAS FLYNN,
Speaker House of Assembly:

MR. SPEAKER:—I am in receipt of a resolution of the House of this date, requesting me to furnish the House my opinion as to the constitutionality of Assembly Bill No. 416 by this afternoon.

The first section of the bill provides that whenever any private school corporation incorporated under the laws of this State, etc., etc., etc., shall file in the office of the State Superintendent of Public Instruction and in the office of the County Superintendent, etc., etc., a certified copy of incorporation, together with an agreement signed by the officers of said corporation to maintain their said school a free public school, according to law, it shall be lawful for, and the duty of the County Superintendent of Public Instruction to appoint the president, secretary, and treasurer of the said corporation, a board of school trustees. By section two this board of trustees are vested with all the powers and privileges, and subject to all the conditions, requirements and penalties contained in the act entitled "An act to establish a system of public instruction," etc. By section nine the county collector in each county is authorized to deduct from the State school moneys due any city or school district, etc., the proportion of State school moneys to which said additional free public school, created by the act, is entitled. The county collector is made the custodian of the money. The county superintendent, upon the warrant of the board of trustees of said public school, shall draw school order or orders upon the county collector in favor of the teachers and the payment of such incidental expenses as the law allows for public schools.

The Constitution of the State, Article I, section 20, provides that "No donation of land or appropriation of money shall be made by the State or any municipal corporation to, or for the use of any society, association, or corporation whatever."

I am of opinion that the act attempts to appropriate money to the use of a corporation within the prohibition of the Constitution. The same question was submitted to me some years since in reference to an appropriation for Rutgers College, and I then gave the opinion that the appropriation was unconstitutional. Having reached the conclusion that the bill is unconstitutional for the reasons stated, it is unnecessary for me to consider the question whether it is in the power of the legislature under article IV, section 7, paragraph 6, in providing for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all the children in this State between the ages of five and eighteen years, to accomplish this result by the instrumentality of a private corporation.

I am, Very truly yours,

JOHN P. STOCKTON,
ATTORNEY GENERAL.

Owing to the adverse opinion of the Attorney General, the friends of the bill immediately withdrew it before a vote was taken. Since, however, it is the avowed purpose of the authors of the measure, after they have remedied, if possible, its constitutional defects, to urge its enactment at a future session of the legislature, there will continue to be considerable local, if not national, interest in the outcome.

A. B. POLAND

CHANGES IN NERVE CELLS

In the November number of the *Journal of Morphology* is a very interesting paper by Dr. C. F. Hodge of Clark University, entitled "A Microscopical Study of Changes due to functional activity in nerve cells." The purpose of the paper is to advance our knowledge, as far as possible, into the conditions of the nerve cell during activity.

To educators the interest of the paper lies in the fact that its author attempts to demonstrate that every state of consciousness is the concomitant of a molecular change in the brain cells; and that a brain cell, like a gland cell, after performing a certain amount of work, becomes exhausted, and needs rest. It has already been shown that a gland cell during rest becomes filled with granules, and that during secretion the granules pass out, leaving the cell more or less shrunken; after an interval of rest the cell is seen to be refilled. "How far," Dr. Hodge asks, "does this same process take place in a cell of the spinal cord or of the brain?" To answer this question he has devised and carried out a number of exceedingly interesting experiments.

I will describe one or two of these, without going into details as to methods, in order to give an idea of the work and its results.

By means of electricity the first thoracic ganglion in the spinal cord of a cat was stimulated for one hour and forty minutes. When this ganglion was compared with one that had been at rest, it was shown that the former had undergone a shrinkage in volume of 25.6 per cent. Having performed a great number of similar experiments, Dr. Hodge concludes that we have as a result of electrical stimulation:

a. For the nucleus: 1. Marked decrease in size. 2. Change from a smooth and rounded to a jagged, irregular

outline. 3. Loss of open reticular appearance, with darker stain.

b. For the cell protoplasm: 1. Slight shrinkage in size. 2. Lessened power to stain or to reduce osmic acid. 3. Vacuolation.

Dr. Hodge further proves that the processes of recovery are, in general, the reverse of those of fatigue, and that after six and a half hours, cells that have been stimulated still show characteristic marks of exhaustion. Where the stimulation has been extreme, the period of recovery is prolonged even beyond twenty-four hours.

The question is naturally asked: "Does the normal activity of an animal result in changes in the ganglion cells like those produced by artificial stimulation?"

English sparrows, pigeons, swallows, and honey bees were experimented upon to obtain an answer to this question. The method was to examine a part or the whole of the brain of the animal after a day's activity, comparing it with the brain of the same species after a night's rest; and in the great majority of instances it was clearly shown that there was a marked modification in the appearance of the cell contents, the fatigued cells having lost their granular substance and looking as though the tissue had been perforated by a charge of fine shot.

A friend remarked to Dr. Hodge just as he was beginning his work: "You will find no changes in nerve cells corresponding to those which take place in a gland. Changes are demonstrable in gland cells, because these produce a material secretion; but the case of a nerve cell is different. Its secretion is consciousness, a thing outside the equation of conservation of physical energy."

Just what this critic, with his naïve commingling of transcendentalism and materialism, thought impossible, was clearly proved to be the fact. A nerve cell is a minute speck of highly unstable protoplasm, and its daily activity results in material changes in its appearance and constitution. Only after a prolonged period of sleep or rest is the normal state of the cell regained. When we say that we are tired it means that the nerve cells are more or less emptied and shrunken. That we are rested means that these cells have become refilled. by a series of nutritive changes.

There is no class of workers more concerned in experiments

of this nature than teachers. When we take up an educational journal and look over the examinations and tests to which children are subjected, and then picture in imagination the shrunken condition of their nerve cells when the task is over, we feel that we may urge a careful perusal of Dr. Hodge's paper, in the hope that such severe strains may be entirely done away with, or at least reduced to moderate limits.

GEORGE W. PECKHAM

SUPERINTENDENT OF SCHOOLS,
MILWAUKEE, WIS.

VIII

REVIEWS

The Formation of the Union.—By ALBERT BUSHNELL HART, Ph. D. [Epochs of American History]. New York and London: Longmans, Green & Co., 1892, pp. xx, 278. Price $1.25.

In nothing has the study of American history made better progress during the last few years than in the issuing of really first-class manuals for students. Among the best of these recent manuals is Mr. Albert Bushnell Hart's *Formation of the Union.* A glance at the book shows that Mr. Hart has thoroughly realized the elementary fact that it takes a great deal more pains to be concise than it does to write at length. His book is a condensation rather than a sketch; that is, it is not a mere rapid glancing over the points which would strike the attention of everyone, but it is a carefully worked out history, each deduction being made after a thorough examination of materials, while the matter not needed has been eliminated after being studied, instead of being rejected offhand without study. One result of this method of treatment has been the laying especial stress upon the causes of the events rather than upon the mere events themselves.

Mr. Hart begins by sketching the peculiar colonial development of the colonies, and then describes the sharp struggle between France and England which ended in the exclusion of the former from the mainland of the American continent. He outlines with remarkable fairness the causes of the Revolution, and shows his sound historic judgment by basing the justification of the Americans, not upon the catalogue of grievances which they drew up, but on the fact that they were standing resolutely against submission to arbitrary irresponsible power. Mr. Hart again shows that he belongs to the new school of historians by the clearness with which he recognizes the disunion of the Americans in the face of their foes, showing that America's real enemies were those of her own household. Especially did she suffer from the lack of wholesouled combination between the different colonies and the different classes of citizens. There was no such fervent and

hearty devotion to the cause of the Revolution as there was three generations later to the cause of the Union when menaced by secession. The spirit of 1776 was inferior to the spirit of 1860. Mr. Hart not only pays proper tribute to Washington's greatness as a man, but, what is more rare, he does full justice to him as a general and soldier.

He then goes on to show the failure of the confederation under which the States at first strove to live after independence became an assured fact, and explains briefly, but clearly, the conditions under which the present Federal Constitution was adopted, and lays proper emphasis upon the fact that the Constitution as adopted was not a compact, that is, an agreement which loses its force when any one of the parties ceases to observe it, but an instrument of government similar in its origin to the constitutions of the States.

Describing the early history of parties under the Constitution, Mr. Hart does full justice to both the weakness and the strength of Federalism. He shows that the Federalists had of necessity to fall, because deep down in their hearts was rooted a distrust of the democratic principle which America represented; and yet he shows no less clearly that, though they disappeared, the most important of the principles for which they had warred really triumphed in the end, and were adopted in fact, although not in name, by the party which overthrew them. Indeed had it not been for the adoption of these principles by the Democratic party after its success in 1800 the government of this country would have had to come to a standstill; and, as it was, it was the weakness and absurdity of the theories of government which were then popular in the nation, and which were typified by Jefferson and his successor, that so nearly brought down utter disaster upon the United States in the War of 1812. Mr. Hart shows well how rife the separatist or disunion spirit was in the Union even down to the War of 1812. In his concluding chapter he describes the administration of John Quincy Adams, and ends his book with an account of Jackson's election. In discussing this, which he aptly calls a triumph of democracy over tradition, he shows his usual clear judgment, especially in recognizing the part played by the West in the contest.

THEODORE ROOSEVELT

WASHINGTON, D. C.

Alcuin and the Rise of the Christian Schools.—By ANDREW FLEMING WEST. The Great Educators' Series, edited by Nicholas Murray Butler. New York: Charles Scribner's Sons, 1892, pp. 1–205. Price $1.00.

This monograph by Professor West is not unworthy of the series in which it appears. The author has brought to bear upon his subject no small share of research; in the main, he uses his authorities to advantage, and succeeds in giving us a fair estimate of Alcuin and his influence as an educator. Mr. J. Bass Mullinger went over the same ground, and while giving us a very readable book he left much to be said about Alcuin. Professor West tells us many of the unsaid things. In Monnier and Werner he had safe guides. He gives us the pith of what the ordinary reader cares to know of Alcuin's educational works, his method, his character, his pupils, and his influence. The professor lost an opportunity to throw light on the Palace School in its varying fortunes under both Merovingian and Carlovingian. The subject is most interesting, and sufficient material exists, though not easily attained. The professor might have taken occasion to give us a chapter on Beda and his methods; for, after all, it was Beda's methods that were practiced in the school of York. Again, the allusions to Scotus Erigena are unsatisfactory and hardly correct. Here is a subject that might have found a place in the book. And strangest oversight of all is the absence of mention of the grammarian Vergilius and the school of Toulouse. And yet the very change of names in the Palace School traces its origin to that of Toulouse. Ever since Cardinal Mai unearthed this school and in five substantial volumes gave us specimens of the work done by its members, it is not creditable to any author dealing with the period to ignore the same. Moreover, in this direction lies a rich mine that has been worked only very slightly.

When Professor West comes to the treatment of Alcuin's controversial works, to use one of his own terms, he makes a sad "mess" of it. The page devoted to Adoptionism (60) is vague and unsatisfactory. The reasoning of the author upon the fact that Charlemagne withheld the civil power to crush this heresy is amusing. It is certainly an unnecessary piece of speculation. As archbishop of Toledo—not bishop, by the way—Elipandus was beyond the jurisdiction of Charles and the influence of Alcuin. As bishop of Urgel, Felix was in the Frankish dominion, and was accordingly summoned by

Charles in 792 to appear at the Council of Ratisbon. Now, instead of saying why Charles did not "crush the heresy," why not state what he did do? Why not tell us that twice this monarch sent missionaries to Urgel to preach the correct doctrine concerning the divinity of our Lord, and that these missionaries converted twenty thousand souls the first time and ten thousand the second time? Here is a fact.

Nor is the professor happier in his treatment of the veneration of images. He begins by calling the Council of Nice "dubiously constituted" (61). In what sense? Did not Irene send a deputation of bishops to Rome requesting Pope Hadrian to direct the action of the council? Where was the irregularity? Of a piece is the assertion, "At this council Pope Hadrian was not recognized as in any way the head of the Church" (61). Somebody has been misleading the professor. Here is the story as rendered by an historian respected by Catholics and Protestants: "There were present, besides the two papal legates, Peter, the Archbishop of St. Peter's, and another Peter, Abbot of St. Sabas, who presided over the council, more than three hundred bishops, either in person or by representation."[1] Surely the presence of the papal legates was a recognition of the Pope's authority. Again, we are told, "Hadrian's dilemma was painful." And forthwith the professor talks half a page of sheer moonshine concerning that imaginary dilemma based upon an imaginary state of affairs. We are regaled later on with the news that Charles "was, moreover, an abominator of image worship." If by "image worship" the professor means that adoration of images which becomes idolatry, he asserts a truism, for every Catholic abominates idolatry. But if he means simply the veneration shown to a picture of Christ or his saints, then I must totally disagree with his assertion, even as Charlemagne would have disagreed with it. The facts of the case concerning the so-called *Caroline Books* are not properly stated by the professor. Mr. Mullinger treats the matter in a fairer spirit. "The Roman Catholic writers," he says, "have generally sought to show that the paper found among the Carlovingian documents against image worship is spurious, and have attributed it to Karlstadt, who heralded the crusade against image worship that preceded the Reformation."[2] Quite a

[1] Alzog, *Manual of Universal Church History*, I: 214, 215, Eng. tr.
[2] *University of Cambridge*, I: 14, 15, note.

number of writers have so considered the paper; still a large portion of the documents might have been written by Alcuin under the dictation of Charlemagne. The Greek text was erroneously translated, and as the decrees were placed before the French emperor they deserved the repudiation they received. Then there was some personal spite cherished by Charles against Irene because she had rejected the offer of marriage of his daughter Rothrud with her son Constantine, which led both Charles and Alcuin into an exaggerated, indeed almost a dishonest, view of the decrees of the Council of Nice. The whole matter has been threshed out by Hefele,[3] whose work is an accepted authority by every impartial historian.

I make these remarks in no carping spirit. Professor West has given us a good book. Were he to omit altogether the pages upon which I have commented, or were he to rewrite them in accordance with history as it has been sifted and authenticated, he would be giving us a better book.

BROTHER AZARIAS

DE LA SALLE INSTITUTE,
NEW YORK, N. Y.

The Foundations of Rhetoric.—By ADAMS SHERMAN HILL, Boylston Professor of Rhetoric and Oratory in Harvard University. New York: Harper & Bros., 1892, pp. ix, 337. Price $1.00.

English Composition by Practice.—By EDWARD R. SHAW, Ph. D., Professor in the School of Pedagogy, University of the City of New York. New York: Henry Holt & Co., 1892, pp. xii, 203. Price 75 cents.

Historical Essays of Macaulay; William Pitt, Earl of Chatham; The Earl of Chatham; Lord Clive; Warren Hastings.—Edited by SAMUEL THURBER. Boston: Allyn & Bacon, 1892, pp. v, 394.

American Prose: Hawthorne, Irving, Longfellow, Whittier, Holmes, Lowell, Thoreau, Emerson—With introduction and notes.—By HORACE E. SCUDDER. Boston and New York: Houghton, Mifflin & Co., 1892, pp. vi, 414.

American Poems: Longfellow, Whittier, Bryant, Holmes, Lowell, Emerson—With biographical sketches and notes.—By HORACE E. SCUDDER. Boston and New York: Houghton, Mifflin & Co., 1892, pp. vi, 453.

The recent discussions of the teaching of English in secondary schools have, for the time being, concentrated a considerable amount of attention on this subject. Books on rhetoric

[3] *History of the Councils*, III: 655–673. Cf. Alzog, *loc. cit.*, pp. 218–222.

without number have poured from the press, while teachers are seeking high and low for methods by which they may render their pupils capable of expressing their thoughts with clearness, force, and at least a modicum of elegance. Notwithstanding the superabundance of text-books, notwithstanding the efforts of teachers, students continue to leave the grammar school, the high school, the college, and the university, who express themselves, when they try to commit their thoughts to writing, feebly, obscurely, and inelegantly, if not ungrammatically. College professors are not slow to lay the blame on the secondary schools, and the secondary teachers with about equal justice attribute the fault to the elementary schools. The college professor holds that it ought not to be necessary for him to teach his students how to write correct English; the high school teacher, that his pupils should have shed all their bad habits of speech before they left the grammar school.

It is more than doubtful whether the ideal of the college professor or that of the high school teacher with regard to the teaching of English will be realized in the near future. The grounds for this somewhat pessimistic opinion are, however, reasonably certain. Most conspicuous of them is the fact that a man's manner of speech is a habit—a habit which it is most difficult to break. Most children are accustomed to hear in their homes and from their playmates grossly defective language—defective, that is, when examined by the standard of the best usage. Defective methods of speech thus acquired are not easily shaken off. The student who has come from the farm or the mill will, except in rare instances of genius, always retain something of his provincial dialect; the student whose playground when a boy was the street of a large city never wholly rids himself of the patois of the gutter. Nor is this all. Elegant writing is one of the fine arts, some would say the chief of the fine arts, and perhaps the most difficult. Now all men would laugh to scorn a proposition to make all men great sculptors or great painters. The thing is impossible. Equally impossible is it to make all men elegant or even correct writers. This attainment is given only to the few. In the case of the many the requisite intellectual power is wanting. In the case of not a few there is probably some congenital brain defect that prevents the acquisition of that indefinable thing called style.

Teachers are now told that many defects in children, such as thought-wandering, irritability, excessive mischievousness, are often due to brain defects, and they are exhorted to study mental pathology that they may learn to apply appropriate remedies. May not some perverse habits of speech, apparently ineradicable, be traced to a like cause? Is it not possible that the boy who invariably uses a verb in the plural form with a singular noun, who sends his pronouns adrift without ever thinking to anchor them to their antecedents, and who leaves his participles suspended in mid air, so to speak, without a noun or a pronoun to modify, is suffering from some brain defect for which neither he nor his teacher is responsible? It may be, after all, that it is the province of the psychologist, quite as much as of the rhetorician, to discover the cause of so much bad English, as well as the true remedy for the disease.

On the other hand, there is some reason to suppose that the trouble is not nearly so great as it is represented. The writing, as well as the reading of English, was never so prevalent as it is at the present day. The writing of ordinary, every-day English is, as anyone who will take the trouble to compare the respectable newspaper of to-day with that of a hundred years ago, very much clearer and more forcible than in days gone by. Compare the awkward, involved English written by Cotton Mather with that of the average clergyman of the present day, and the comparison will be very much in favor of the latter. More than this, if our best writers are compared as to style with those of the last century they will not suffer in the eyes of any competent judge. George William Curtis wrote better English than Addison or Steele; James Russell Lowell, than Samuel Johnson; and, had Robert Louis Stevenson lived in the days of Smollett and Richardson, they would have been merely foils to display better his exquisite art. The fact is that good writing—albeit the amount of bad writing is almost infinite—is now so common a thing, comparatively speaking at least, that our great writers no longer appear great. They are not, like their predecessors, conspicuous because of their isolation.

While, therefore, there may be much less to deplore with regard to the teaching of English than the great outcry about the deficiencies of college students would lead one at first sight to suppose, yet every thinking teacher will welcome the books whose titles stand at the head of this article as

distinct additions to the appliances for the teaching of good English. Professor Hill, who has already given to the world several useful and entertaining books on English, writes on the foundations of rhetoric with the authority of a master. What he considers them to be he states in his preface:

"Differ as good writers may in other respects, they are all distinguished by the judicious choice and the skillful placing of words. They all aim (1) to use no word that is not established as a part of the language in the sense in which they use it, and no word that does not say what they wish it to say so clearly as to be understood at once, and either so strongly as to command attention or so agreeably as to win attention; (2) to put every word in the place fixed for it by the idiom of the language, and by the principles which govern communication between man and man—the place which gives the word its exact value in itself and in its relations with other words; and (3) to use no more words than are necessary to effect the purpose in hand. If it be true that these simple principles underlie all good writing, they may properly be called The Foundations of Rhetoric."

After an admirably clear and concise treatment of the leading facts of English grammar, Professor Hill divides the body of the book into three parts. In Part I. he treats of words that are proper and words that are improper, arranged in classes to correspond with the several parts of speech, and of questions of choice between words equally proper. In Part II. he discusses good and bad sentences, arranged in chapters to correspond with the five important qualities of style, and of questions of choice between sentences equally proper. In Part III. he unfolds the laws of the paragraphs.

For the matter contained in these three parts, as well as for the plan according to which it is arranged, there can be nothing but praise. While it is obviously impossible to collect and specify all possible departures from good usage in English, it is a very important thing to have the categories of errors to one or other of which every possible blunder may be referred, stated, and clearly defined. This, I think, Professor Hill has done better and more fully than I remember to have seen it done elsewhere. His treatment of the paragraph, too —something too often neglected in works on rhetoric—is altogether admirable.

One defect, however, there seems to be: the average

teacher, accustomed to text-books that present rules and principles and then exercises to be performed by the student, will not know how to use this book, and nowhere does the author tell him how to proceed. There are no exercises as such. There is an abundance of examples, but, when the proper form is presented first and the improper form afterward, as is invariably the case, what is the teacher, to whom the correction of "false syntax" is a second nature, to do? Assign lessons in this book to be memorized, he cannot. Assign faulty sentences to be corrected, he cannot; for that work is all done in plain print. Exercises in composition there are none. Will not Professor Hill come to the rescue of his friends, the teachers, by taking an early opportunity to tell them how to use his book?

The defect, if defect it be, noted in Professor Hill's book, cannot be charged against that of Professor Shaw. The latter is full of admirable exercises, adapted, however, to much less advanced students than the former. The inductive plan is pursued throughout; that is, rules and definitions are evolved from examples, and are then applied in numerous exercises that bring into play the knowledge and skill of the student. The exercises are, as a rule, highly ingenious, many of the devices seeming to be new, while the book as a whole has a literary flavor that is quite acceptable. Such being the case, it is to be regretted that the author has omitted all treatment of the paragraph, and that he has devoted so much space to the subject of paraphrasing—an exercise that usually results in spoiling good poetry in order to make bad prose.

The study of good literature, however, is much more useful than the study of rhetoric in acquiring the power to use good English. The attainment of this power is very largely a matter of imitation, and the publishers, who have brought suitable literature within the reach of every child, have conferred an incalculable boon on all classes of schools. The three volumes of this character that lie before me—Macaulay's *Historical Essays*, edited by Mr. Samuel Thurber, and *American Prose* and *American Poems*, edited by Mr. Horace E. Scudder—contain some of the best English literature for school use. They are not overloaded with annotations. The work of the editor is confined to explaining those things that cannot easily be found in common works of reference, and to pointing out fruitful lines of investigation. The boy or girl

who carefully and reverently studies these volumes, can scarcely fail to imbibe something of the brilliancy of Macaulay, of the subtilty of Hawthorne, of the sweetness of Longfellow and Whittier. If literature be properly taught, literary training and moral training cannot fail to go hand in hand.

W. H. M.

The State: Elements of Historical and Practical Politics, a sketch of Institutional History and Administration.—By WOODROW WILSON, Ph.D., LL.D. Boston: D. C. Heath & Co., 1892, pp. xxxiii, 686. Price $2.00.

The peculiar transition period which our system of public instruction is now passing through, has called into being many text-books designed by their authors to answer the demands of the hour. The difficulty in the way of successfully doing so is of a twofold nature: first, the fact that, while instruction in schools of primary grade has been much modified by the general tendency toward the synthetic method, in the higher grades this tendency has been checked by the essentially didactic character of many of the studies pursued; and second, the fact that the authors of such books, who are usually educators and so allied by long habit to the older system, when endeavoring to approach the scientific method in response to popular demand are unable to handle the subject consistently from this point of view, and the result is inharmonious and disappointing. In Mr. Woodrow Wilson's book, which seems to have been designed for academies and the smaller colleges—for it is certainly too voluminous for elementary schools, and too inclusive for mature students—this defect is very apparent. The author premises that our government, laws, and social customs have certain immediate origins, and that for the English and American students it is enough to understand these. He traces the course of many of our more complex social conditions through the Celtic, Slavonian, Greek, and Roman developments, and seeks the common origin of government as known to us in the Aryan family, which he concludes was distinctly patriarchal. It is unfortunate that he has employed the term *Aryan* to express either a race, class of customs, or laws; as no investigator of standing, with the possible exception of Max Müller, has now any confidence that such a distinct race

ever existed. Philology may still cling to such a parent tongue, but such a race eludes anthropological research.

Mr. Wilson endeavors to be just and points out that there is a wide difference of opinion as to the patriarchal family being the source of government, or as to the original family being distinctly patriarchal in its nature; yet he settles upon this as a distinctly Aryan fact, and then proceeds to evolve from such an origin various customs and laws that could only have arisen in a matriarchal or polyandric community.

The latter part of the book, which is chiefly a compend from various works upon the governmental systems of Greece, Rome, Germany, France, England, and America, is a convenient handbook for the closest student, and is generally correct in detail. If the book is designed for immature youths, its value would be increased if the author held to a clear theory of governmental evolution, and followed it logically and consistently, even if many details inconsistent therewith had to be omitted. If intended for the mature student no method is admissible save that so ably followed by Darwin in his *Origin of Species*, the method of presenting first the allied groups of verifiable facts and then drawing the necessary deductions therefrom.

JOHN S. FLAGG

BOSTON, MASS.

IX

EDITORIAL

The leading articles in the EDUCATIONAL REVIEW for this month are more than usually rich in content. Commissioner Harris's lucid statement and unqualified indorsement of the central principle of the Herbartian system of pedagogy will surely increase the enthusiasm and widen the circle of Herbart's disciples in this country. Professor Howison exposes the shallowness of many widespread opinions regarding the control and support of schools by the state, and sets forth what he believes to be the true ground. When he argues, however, against making education entirely free, and in favor of state control of private schools, he runs counter to so many of the most cherished ideas of the American people that this expression of opinion is certain to stir up a controversy which cannot be otherwise than beneficent in its effect. It is well that men should be constrained at times to re-examine the foundations of their faith. Supervisor Martin in his article on "Horace Mann and the revival of education in Massachusetts" makes a most important and interesting contribution to the history of education in America. President De Garmo advances a practical application of the much discussed but little practiced theory of the correlation of studies in elementary schools. It is safe to say that no more important subject than this can be brought to the attention of teachers. It would be premature to assert that President De Garmo's solution of the problem is final, but few will be found to doubt that the plan which he originates would be far preferable to the confused and confusing courses of study now in vogue. Miss Hornbrook's article on "The pedagogical value of number forms" brings to light some forgotten facts in psychology that have a most direct bearing on the teaching of elementary arithmetic.

The New Jersey parochial school bill, the full text of which is printed in this number of the EDUCATIONAL REVIEW, is

exciting attention in all parts of the country. Though failing to become a law, in fact to be pressed to a vote in the legislature, by reason of its alleged unconstitutionality, it nevertheless presents the question in a new light, and indicates pretty clearly what is likely to be the policy adopted by the supporters of the Catholic parochial schools. The recent decision of Monsignor Satolli, denying the right of the priests to withhold the ordinances of the Church from the parents of children who attend the public schools, has doubtless precipitated action on the part of those who are responsible for the introduction of the New Jersey bill. The number of parochial schools has increased rapidly in New Jersey during the past few years. Their maintenance will be especially burdensome, if attendance on them cannot be enforced by the Church authorities. The exigency of the case, it is said, led to the present unexpected move to secure state aid for their support.

Not satisfied with the slow progress of adjusting the relations of public and parochial schools by municipal compromises as in Stillwater and Faribault, the authors of the New Jersey bill have thought it the best and shortest way to appeal directly to the State legislature. This decision on their part should be heartily welcomed by the opponents of state aid to parochial schools, since it will enable the much vexed question to be the sooner settled. There will no longer be any beating about the bush nor misunderstanding of intent; the discussion will be removed from the pulpit to the forum.

If the bill referred to is carefully studied, the change of base will occasion some surprise. It is no longer urged that the public schools are unfit schools; for the present at least the action of Monsignor Satolli in permitting attendance on these schools has set that question at rest. It is now claimed that the State should foster the parochial schools on the ground of public policy, or, better, perhaps, of public necessity, that is, to quote the bill, "in order to increase public school accommodations and to carry out more freely the provisions of the constitution, wherein the legislature is empowered and commanded to provide for the maintenance and support of a thorough and efficient system of free public schools for the instruction of all children in the State between the ages of five and eighteen." The fact is admitted, say the advocates of the bill, that the State has thus far failed to provide ade-

quate and suitable accommodations for all children of school age, as the constitution requires. Now, therefore, it is the part of wisdom and economy for the State to accept the aid of private school corporations. In consideration of a nominal charge for the payment of teachers' salaries, these private school corporations will furnish buildings, equipment, etc., and enable the State to carry out its constitutional obligations to all its people.

Viewed from the standpoint of many even of those who are not advocates of Church schools, this offer will appear reasonable and worthy of consideration. That it violates the existing system of schools maintained wholly by the State they consider of no great moment. The advantage to the State outweighs any sentimental considerations. This is the view of the case taken by the authors of the New Jersey bill, many of whom, it should be said to their credit, have proved themselves in the past real friends of the public schools. It is claimed by them that the bill is in no sense inimical to the public schools; it is to supplement their usefulness.

By the provisions of the bill, all private school corporations without regard to sect may, by coming under its provisions, participate in the benefits of the proposed law. Hence it is maintained that the bill is in no sense sectarian. It prohibits religious instruction within school hours, and hence is not in the interest of any creed. It furnishes instruction free to all, and hence establishes schools that may be rightly considered as free public schools.

As a compromise measure, it may be said to yield on the part of the parochial schools the following points, heretofore stoutly contended for: 1. That schools so established shall be under State and municipal inspection and supervision. 2. That all teachers employed shall be regularly licensed by the State authorities. 3. That no religious instruction shall be given in school hours.

On the part of the State it requires that the following points shall be conceded: 1. That the governing board of trustees, though formally appointed by the State authorities, shall be in fact designated by the private incorporators, and not directly or indirectly by the people. 2. That there shall be contributed by the State for the maintenance of these schools a sum equal to the average cost per child to the State for the year preceding, as determined by actual attendance.

It will doubtless appear to many who are not Catholics that a compromise along the lines indicated would be an equitable and safe adjustment of the whole controversy. That the compromise will be accepted by the friends of the American system of free public schools, maintained and governed exclusively by the people, is more than doubtful. The request for amnesty, it should be observed, comes from the parochial school side; it is a confession of weakness; as such it will nerve the friends of the public schools to a stouter resistance against any encroachment upon the existing order.

The battle royal was fairly begun when an appeal was taken to the New Jersey Legislature. The authors of the bill claim that the adverse decision of the attorney general will only temporarily deter them from pressing the measure to an issue. The outcome is not yet.

The continued success and prosperity of the Teachers' College of New York—known until recently as the College for the Training of Teachers—is matter for congratulation. This institution, organized only nine years ago under the name of the Industrial Education Association, has steadily won its way into public esteem and favor. While still standing on its own foundation it had demonstrated that there was a reason for its existence; but now that it has become affiliated with Columbia University it is evidently about to enter on a career of more extensive usefulness. Mr. George K. Vanderbilt has donated a magnificent site for a new building in the immediate vicinity of the new location of Columbia. A lady, who makes the condition that her name shall not be disclosed, has given $225,000 for the mechanic arts building; while toward the construction and equipment of the main building the sum of $150,000 has been raised, and of the $200,000 necessary for its completion $60,000 has been pledged on condition that the remainder shall be subscribed.

The college has steadily pursued two main lines of work—the training of teachers, particularly specialists in kindergarten work, elementary science, physical culture, form study and drawing, and manual training, including cooking, sewing, and wood and iron work, as well as all-round teachers for grade work in elementary schools; and the maintenance of a model school extending from the kindergarten to the high school.

It has done much to introduce and popularize the ideas of the "new education," by demonstrating in its model school their availability, and by sending out teachers admirably equipped to carry them into effect. With increased facilities for work it will certainly accomplish much more.

It is to be hoped that the Teachers' College in its new home will pay special attention to the training of teachers for secondary schools. While the idea is steadily gaining ground that professional training is necessary for the teacher in an elementary school, the feeling is still prevalent that anyone who graduated from a college is fitted to teach in a high school.

The German Department of Harvard University has issued a pamphlet describing the advantages offered at Harvard for the advanced study of German literature and Germanic philology, which, although mainly addressed to German-Americans, is of general educational interest. It appears that of the twenty-eight courses conducted by the department there are twelve dealing with subjects which may properly be called university studies, such as history of German literature in the twelfth and thirteenth centuries, history of German literature and art in the period of the Reformation, Germanic mythology, Germanic antiquities, history of the Faust legend, Gothic, Old Saxon, Old Norse, etc. The teaching force consists of four professors and five instructors, of whom five are natives of Germany. Of the 940 students who, during the current year, were enrolled in the department, about one hundred took courses wholly or in part intended for graduates. Taken together with the excellent work done in the same direction at Johns Hopkins, Ann Arbor, Columbia, Cornell, and elsewhere, this condition of things at Harvard goes to show that, having long ago distanced England in modern language instruction, the universities of this country are now in this line of study also fast approaching the level of continental university methods.

The report of President Warren of Boston University for the year 1892 tells a most gratifying story of enterprise and progress. The whole number of students in all departments was 1069. Since 1880 the increase has been over one hundred

per cent. The number of students in the "school of all sciences," corresponding to the post-graduate departments of other universities, was 117; the number in the school of theology was 160; in the school of law, 210; in the school of medicine, 132; in the school of agriculture, 163; and in the college of liberal arts, 329. The number of young women was 312; and of young men, 757. During the past eighteen years young women have formed, on an average, twenty-five per cent. of the total enrollment. President Warren does not discuss the propriety of coeducation of the sexes; he seems to regard it as demonstrated. Though the net assets of the institution have increased in value from $330,565 in 1879 to $1,518,796 in 1892, its administration is "still embarrassed for lack of necessary means, and compelled to enforce in many directions painful and injurious economies." President Warren sets forth both the past achievements and the present necessities of the university with sufficient plainness of speech.

The Harvard Teachers' Association, composed of officers and graduates and former students of Harvard University who are now engaged in teaching, recently held an important meeting in Cambridge, Mass. About two hundred representatives of New England colleges and secondary schools were in attendance. The study and teaching of English, electives in elementary education, and the correlation of studies were discussed.

Professor Tufts of the Phillips Exeter Academy pointed out that in spite of Mr. Adams' report, good instruction in English is given in the preparatory schools, and after describing his own plan of teaching English, he laid stress on the important point that the teaching of English is not the exclusive business of the "instructor in English."

Principal Edward J. Goodwin of the Newton High School, whose paper on "Electives in the High School" was published in the EDUCATIONAL REVIEW for February last, now carries the principle of election into the grammar school period, contending that at the age of eleven or twelve a child should have completed that part of the curriculum which is concerned with those rudiments of knowledge that are essential for a man in any condition or pursuit of life. At that age, uniformity should give place to diversity, and provision

should be made for three classes of pupils: (1) those who leave school on the completion of the grammar school course; (2) those who take a part or all of the high school course; and (3) those who prepare for college. For the first class, a four years' course and for the other two a six years' course should be provided, both with certain prescribed work, with a somewhat restricted range of electives for the second class of pupils, and with nearly all the subjects electives for the pupils of the third class. The proposition is one worthy of the most serious consideration.

President De Garmo's important paper on the correlation of studies comprised a criticism of the Herbart-Ziller attempt to make the educational value of every subject consist of an ethical content, and placed the whole subject of correlation on a rational basis. The paper is published in full in this issue of the REVIEW.

Professor Paul H. Hanus, secretary of the association, proposes that at future meetings the views of prominent men interested, but not actively engaged, in educational work, shall be presented, in the hope of facilitating co-operation between the teachers and the intelligent leaders of the community—a most desirable consummation.

The powerful arraignment made by Superintendent John Swett of San Francisco of the methods employed by the board of education of that city in the appointment of teachers, has led to important and satisfactory results. The old method, which Mr. Swett characterized as "the worst in the world," has already been described in the EDUCATIONAL REVIEW.[1] Under the new rules, the principle of competitive examination is introduced. "After July 1 of each year," the rules read, "the first six vacancies occurring in the substitute class shall be filled by appointment from the graduates of the normal department of the girls' high school of that year, the selections to be made . . . from the twelve who graduate with the highest percentage." "A competitive examination," the rules proceed, "shall be held of graduates of the city normal school, exclusive of the graduating class of the current year, and, out of the number of those applying, the twelve who shall upon such examination be found to be the best qualified, shall be deemed to be entitled to be appointed

[1] EDUCATIONAL REVIEW, Vol. V: 310.

teachers." The eighteen persons selected in the manner described above, are to be appointed to fill the first eighteen vacancies that may occur in each year. Should further vacancies occur, the appointments may be made in the old way, but by the following clause a restriction of vital importance is placed on the power of the members of the board: "No one shall be appointed a teacher in the schools of this city who is not a graduate of some normal school or other institution of learning of equal or higher rank, with a regular diploma therefrom, or who shall not have had at least one year's successful practice in teaching in primary or grammar schools, and holding first grade certificates." The competitive examinations are to be conducted by a committee consisting of the superintendent, and not less than five members of the faculty of the University of California.

While it is open to serious doubt whether competitive examination is the best method of determining the fitness of teachers, yet it is evident that the new plan is very much better than the old. The most important feature of the new rules, however, is the fact that hereafter no one who has not received sound professional training, or who has not had at least one year's successful experience in teaching, may be appointed a teacher in the public schools of San Francisco. This rule sets a minimum of qualifications, which, even should the school board return to the old political methods of appointment, will prove a sufficient barrier against the inroads of the inefficient.

At least two other regulations are required to complete in a reasonable manner the San Francisco plan: Teachers should be appointed only on probation at first, and the superintendent and principals of schools should be given a voice in making appointments, so that the appointees may feel a definite responsibility to the supervising authorities. Where each person in a school system is not charged with definite responsibility for definite work, and where the failure to perform adequately certain definite duties is not visited with appropriate punishment, a system of public schools can never reach its highest efficiency.

The report of General Agent Jackson on education in Alaska, one of the documents embodied by Commissioner

Harris in his report for 1889–90, is an interesting and instructive pamphlet. Alaska has at present 15 day schools, supported wholly by the government, with a total enrollment of 1110 pupils; 9 contract schools, containing 302 pupils, supported jointly by the government and the missionary societies; 10 mission schools, with an enrollment of 297 pupils, supported wholly from the funds of the churches; and 2 schools containing 79 pupils, maintained on the Seal Islands by the North American Commercial Company, under contract with the Treasury Department. In all, there are 37 schools, with 1788 pupils.

The report, in addition to information about the schools, sets forth a vast array of ethnological facts which must be considered by anyone who would attempt to solve the educational problems of our vast northwestern possession. The native people, forming almost the entire resident population, have, for the most part, barely emerged from the lowest barbarism. They are ignorant of the mechanic arts, except those rude manifestations which the necessities of hunger and the rigors of the climate have called forth. They have made scarcely an attempt to till the soil, though in the "temperate belt" on the southern coast there are large areas suitable for cultivation. And worse than all, they are much given to drunkenness, and have not even elementary notions of morality.

The United States has a great duty to perform toward these benighted people, to whom trade has brought the vices, and few or none of the virtues, of civilization. Only by educating the young into habits of virtue and industry can the native races of Alaska be redeemed. And yet for this purpose the appropriation by Congress has been wretchedly inadequate. Mr. Jackson estimates that there are 10,000 children in Alaska. For the education of these children Congress has allowed only a beggarly pittance of $50,000 a year. Moreover, the appropriation has frequently been made at such a time and in such a way that "the teachers are compelled to teach the entire school year without knowing whether any appropriation has been made to pay them." Under the circumstances, the request that the annual appropriation be increased to $75,000 is a very modest one, and should be granted without delay or opposition.

Among other suggestions made by Mr. Jackson are the

following: that "some authoritative regulations that will secure the more regular attendance of the native children" be adopted, the irregularity of attendance being now one of the great obstacles to progress; the establishment of a school to teach the management, care, and propagation of reindeer, and to conduct a series of experiments to determine the agricultural capabilities of the country; and that, in the villages containing a number of white people, the voters be permitted to elect school committees, who, subject to the approval of the commissioner of education, shall appoint the teachers of the white schools. These suggestions seem entirely feasible, and their adoption would no doubt result in great benefit to the country.

The establishment of free public education in England is beginning already to bear good fruit. In the recent discussion in the House of Commons on the grant for public education in England and Wales, Mr. Acland, on behalf of the government, stated that while the increase in attendance on elementary schools in 1889–90 was only 35,000, and in the following year still less, during last year it had reached 120,000. About one-half of this increase is credited to "infant schools," in which the children are, as a rule, under seven years of age. Mr. Acland stated further that the passing of the Assisted Education Act had largely increased the attendance of children up to the age of thirteen, though he was unable to say whether the increase was greater in the large towns or in rural districts. The number of free scholars in England and Wales is now about 3,800,000, and the number of children still paying fees is about 1,020,000. It thus appears that the establishment of free public schools has had a much more potent effect in inducing parents to send their children to school than the operation of the compulsory education law. At the same time the London *School Guardian* deplores the fact that the attendance on evening schools is growing less year by year, and remarks: "When we remember what is done in continuation schools abroad, it is disappointing to find that, although something like half a million of children leave school at the age of thirteen, only about ten per cent. of that number attend evening classes." A similar condition is to be deplored in every large city in the United States.

At the April meeting of the Massachusetts Association of Classical and High School Teachers, Mr. John F. Casey, a master in the Boston English High School, read a paper on "Successful Preparation for College by English High Schools." Taking as data for inference the college records of about forty graduates of the school with which he is connected, Mr. Casey drew the conclusion that schools in which Greek is not taught, but in which English, the modern languages, and the sciences hold places of honor, furnish at least as good a preparation for collegiate work as the classical fitting schools. In the discussion which followed attention was drawn to the fact that the mathematics and advanced physics accepted as a substitute for Greek in the requirements for admission to Harvard College, call for more severe and prolonged training than the Greek for which they are counted as an equivalent. President Eliot, who took part in the discussion, cordially admitted this fact, and stated that the subjects established by the faculty as approved substitutes for Latin and Greek had been purposely made disproportionately severe by the hostile majority in the faculty, in order to discourage candidates from offering themselves for examination in these subjects. The consensus of opinion, as expressed in the discussion, was that this discrimination in favor of Greek had remained in force quite long enough; and a resolution, to be submitted to the Harvard Faculty, was unanimously adopted, declaring that the substitute for Greek required for admission to the college is disproportionately severe and lays too heavy a burden on the secondary schools.

A bright and timely paper on "English in Secondary Schools" called out a spirited discussion of the report of Mr. Adams's "detective agency" on the teaching of English in the schools which send students to Harvard College. Mr. Bradbury of the Cambridge Latin School, in a searching analysis of the testimony offered by the committee as to the teaching of English in his own school, after referring to the natural bias of the witnesses summoned, proceeded to point out in detail the mutually contradictory character of their testimony. One boy, for example, said, "I should think that the proportion of English composition to our other studies was about one-sixth"; another, "I should say that the time given to English was to the time given to other subjects as one is to one hundred thousand." Other speakers declared that the spirit and

method of the investigation conducted by the committee, who, "to accomplish [their] object," found it "necessary" to use "for purposes of illustration, only the poorest papers of those handed in," were grossly discourteous and unjust to the schools, and discreditable to the committee; that the sight translations from Latin, which were exhibited as results of defective training in English, showed defective knowledge of Latin on the part of the students, defective reasoning on the part of the committee, and nothing else whatever; and, in short, that the report of the committee was so far from meriting the compliment of formal remonstrance on the part of the association that it was unworthy even of serious consideration. In view of the indignant and resentful spirit which marked the discussion it may well be doubted whether the committee were not somewhat sanguine in assuming that their report would "operate directly on the preparatory schools with a view to elevating the standard and changing radically the methods of instruction in English composition pursued in them."

Among other subjects discussed, were recent German educational literature, by Professor Burnham of Clark University, and "Empirical Geometry in the Grammar School," by Professor Safford of Williams College.

An unusually interesting programme is in course of preparation for the University Convocation of the State of New York, which will be held at Albany on the 5th, 6th, and 7th of July. Invitations have been sent to prominent educators in Europe, and there is reason to believe that the annual address will be delivered by a distinguished foreigner. Perhaps the most interesting feature will be a discussion of the effect that the establishment, by the government, of a national university at Washington would have on the cause of higher education. The advocates and opponents of the movement will be given ample opportunity to participate. Special prominence will be given to the teaching of English in all grades.

An important change has been made in the curriculum for the sophomore year at Yale. Hitherto out of fifteen hours a week of the work for that year thirteen have been entirely required, a choice being allowed only between two hours each of

French or German. The other thirteen hours have been occupied by Latin, Greek, mathematics, and English, the English being the least extended. Hereafter fifteen hours will be required from each sophomore, and six courses of three hours each will be offered, as follows: Mathematics, Physics, Greek, Latin, English, and either French or German. Some one of these six must be omitted.

President Thwing of Western Reserve University offers two prizes, one of thirty dollars, and one of twenty dollars, for the two best essays on "The value of a college education to a boy." The writer of each essay submitted must be a boy and a member of the senior or graduating class of a high school or an academy fitting for the best colleges. The essays are to be sent to President Thwing on or before August 1, 1893. The two that are successful will become the property of the donor of the prize, and will be published. President Thwing's object is "to direct attention to the value and to emphasize the importance of a college education."

Though the National Bureau of Education has not any part in managing the country's educational exhibit at the World's Fair, as it had at the New Orleans Exposition, yet it will itself be represented by a unique and interesting exhibit. This exhibit, prepared under the direction of Commissioner Harris, will make a very complete exposition of the scope and functions of the bureau as an office of the Interior Department. The bureau is the governmental agency for collecting and disseminating information respecting education, and as such it will be represented.

The educational world has suffered a severe loss by the death at Dresden of the Baroness von Marenholtz-Bülow, who was the chief interpreter of Froebel, and who rendered invaluable assistance to him in his attempts to introduce to public attention his kindergarten system. The baroness was a woman of great intellectual power, and without her *Recollections of Friedrich Froebel*, we should possess no lifelike portrait of the great philosopher, philanthropist, and educational reformer.